The IRON AGE

March 6, 1958 A Chilton Publication The National Metalworking Weekly

"Explorer" Nose Cold Formed From 430 Stainless P. 113

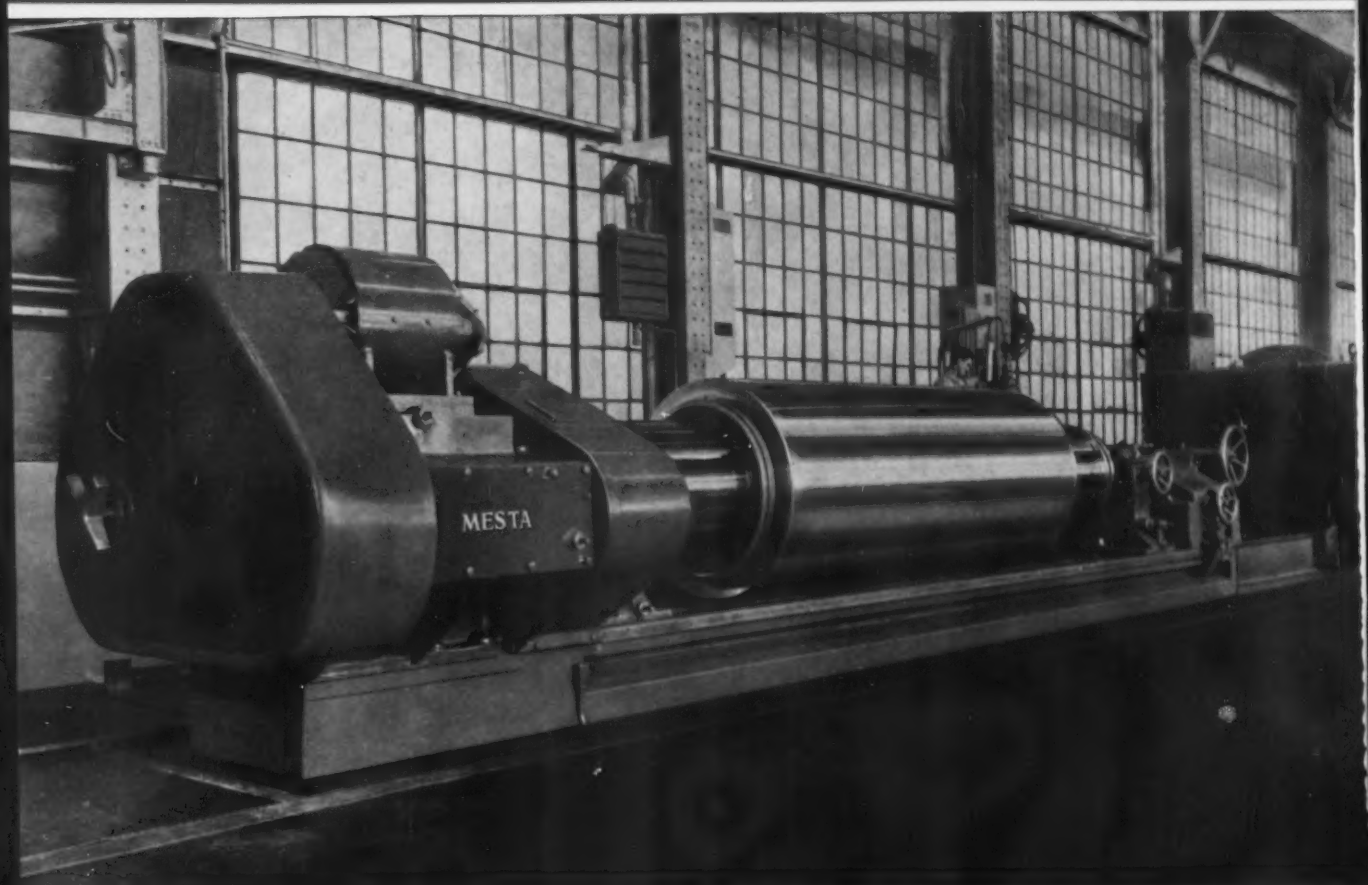
Nickel Goes After New Applications – P. 73

Are Appliances Making a Comeback? – P. 78

Digest of the Week P. 2-3

Heavy Duty ROLL GRINDERS

Designed and Built by MESTA



Mesta Heavy Duty Traveling Wheel Type Roll Grinder
Finishing a 59" x 154" Mesta Backing-Up Roll

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

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"Wooden" television cabinets from steel sheets

Although from ten feet away they look like richly grained and polished wood, many television cabinets are made from sheet steel. First, the steel sheet is shaped in die and press-brake operations into a shell, then braced and gusseted for rigidity. Next, the unit is cleaned and Bonderized for painting.

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Indexed in the Industrial Arts Index and the Engineering Index.

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The IRON AGE

March 6, 1958—Vol. 181, No. 10

Digest of the Week in

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NEWS ARTICLES

NICKEL

The Hard Sell—After allocating metal for years, nickel salesmen are out making calls. Output has finally

topped demand, and there is some hard selling and market development in store for the industry.

P. 73

DETROIT DILEMMA

Output Cut But Stocks Rise — Doubts over the prospects of a spring upturn in sales have automakers worried. Impending union negotiations and unemployment complicate the situation. P. 76

BUILD OR RENOVATE?

How Cadillac Decided — Modernizing an old plant cost Cadillac Div. only one-third as much as building a new one. But modernizing without losing production time posed a major problem. P. 90

REPORT TO MANAGEMENT

Labor on Tightrope — Labor leaders may have talked up the

Metalworking

EXPLORER'S NOSE: Stainless steel nose cones being checked by inspector at Lodge & Shipley Co. are for Army Explorer satellite. L & S developed a special cold forming process which literally flows a metal blank into shape. P. 113

recession too much for their own good. Depression talk makes a poor starting place for demands for a big wage hike. P. 89

AIRCRAFT LABOR

On the Defensive—Management has a definite edge over unions in West Coast aircraft contract negotiations. Declining business, unemployment raise the odds against chances for a wage increase. P. 97

FEATURE ARTICLES

ULTRATHIN OXIDE FILMS

Aid Research — Scientists are making self-supporting aluminum oxide films only one-millionth of an inch thick and 2 in. or more in diameter. It's done as a matter of routine by chemically dissolving away aluminum foil and saving the oxide film which coats it. Primary use thus far is in electronic imaging tubes. P. 116

FOR LONGER TOOL LIFE

Alter Structure — A new technique increases the life of nearly all high-speed steel tools by transforming retained austenite into martensite. It's a treatment that penetrates the whole section of the tool. Shop tests show 75 to 400 pct more cuts per grind. P. 117

HOT-WORK TOOL STEELS

For Aircraft and Missiles—Part 2 of a survey on hot-work tool steels gives a rundown of the actual experience of users in the aircraft and missiles industry. P. 120

STEEL-TUBE STAMPINGS

Short Cut to Complex Shapes — By switching from solid bar stock to welded steel tubing, savings up to 92 pct can be made without altering product design. The method offers dimensional accuracy. P. 122

NEW MATERIAL

Combines Virtues — The family of new materials called "Pyroceram" is basically a kind of glass, but combines the properties of both metals and ceramics. Because it's not a single material, it can be individually formulated to suit a variety of uses. P. 126

MARKETS & PRICES

APPLIANCES

May Lead Upturn—Producers of major appliances predict their sales will begin gaining strength in May. They have good reason. New housing starts are up and dealer inventories are low. P. 78

1957 STEEL SHIPMENTS

Fell Below '56 Levels — Steel mills shipped 79.9 million tons in 1957, a drop of over 3.3 million from tonnage the previous year. Construction industry retained its lead over automotive as the single largest consumer. P. 80

IRON ORE

Foreign Ventures—In the midst of a steel recession, big ore projects are in the works. M. A. Hanna looks to South America, J & L to Canada. P. 81

TOOL OUTLOOK

Lean Days Ahead—New machine tool orders totaled only $19.4 million in January, compared to $63.3 million a year ago. Replacement sales and new tool development offer some hope. P. 99

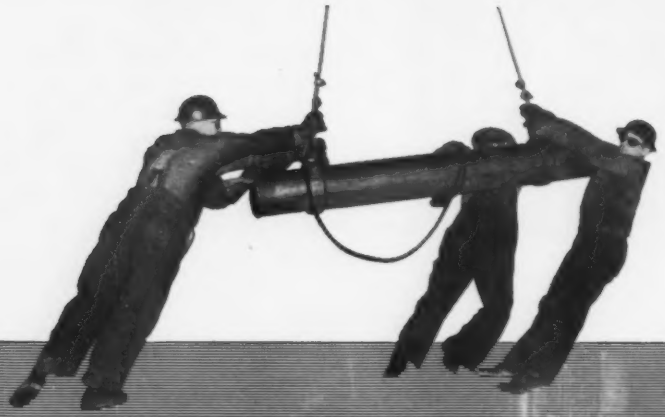
HAND-TO-MOUTH?

Cold Wave Did It—The recent heavy snows and freeze-up revealed some significant weaknesses in steel user inventories. At one point the mills were pulling steel off barges and rushing them to customers. P. 169

NEXT WEEK

BUSINESS TENSIONS

Getting You Down? — Next week's survey report on business tensions should be of great interest to every businessman in these pressure-packed, competitive times. It tells what causes tensions, and what you can do about easing tension.



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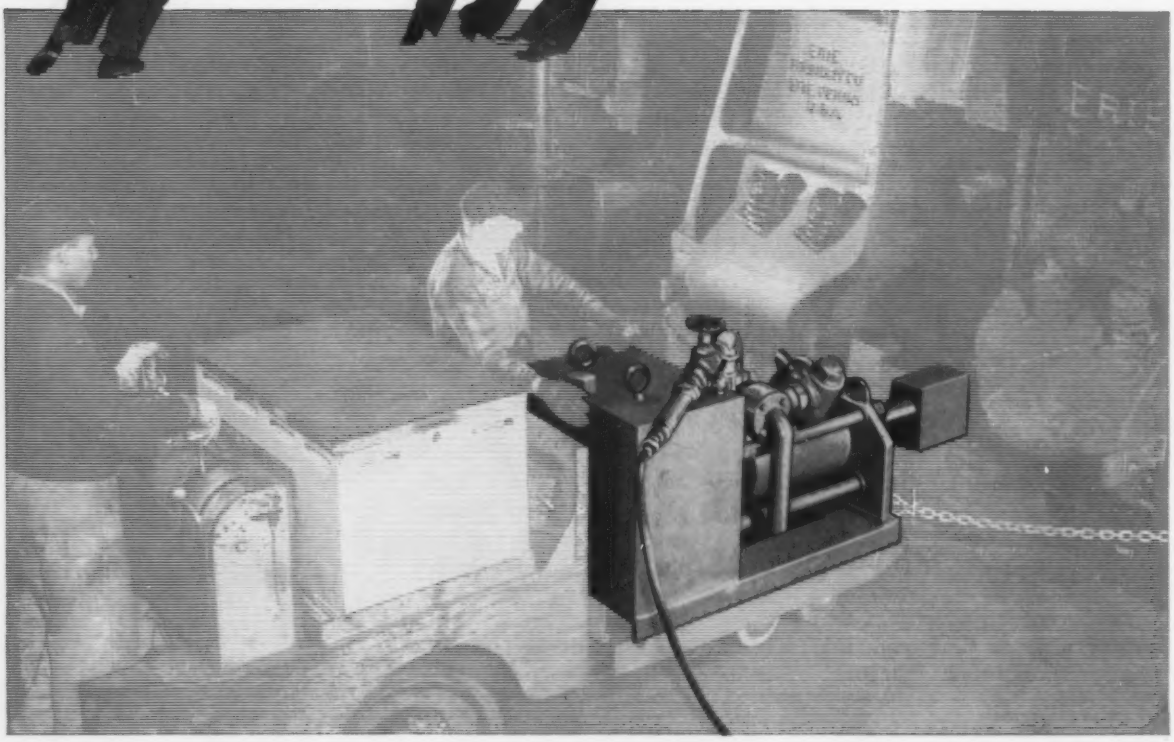

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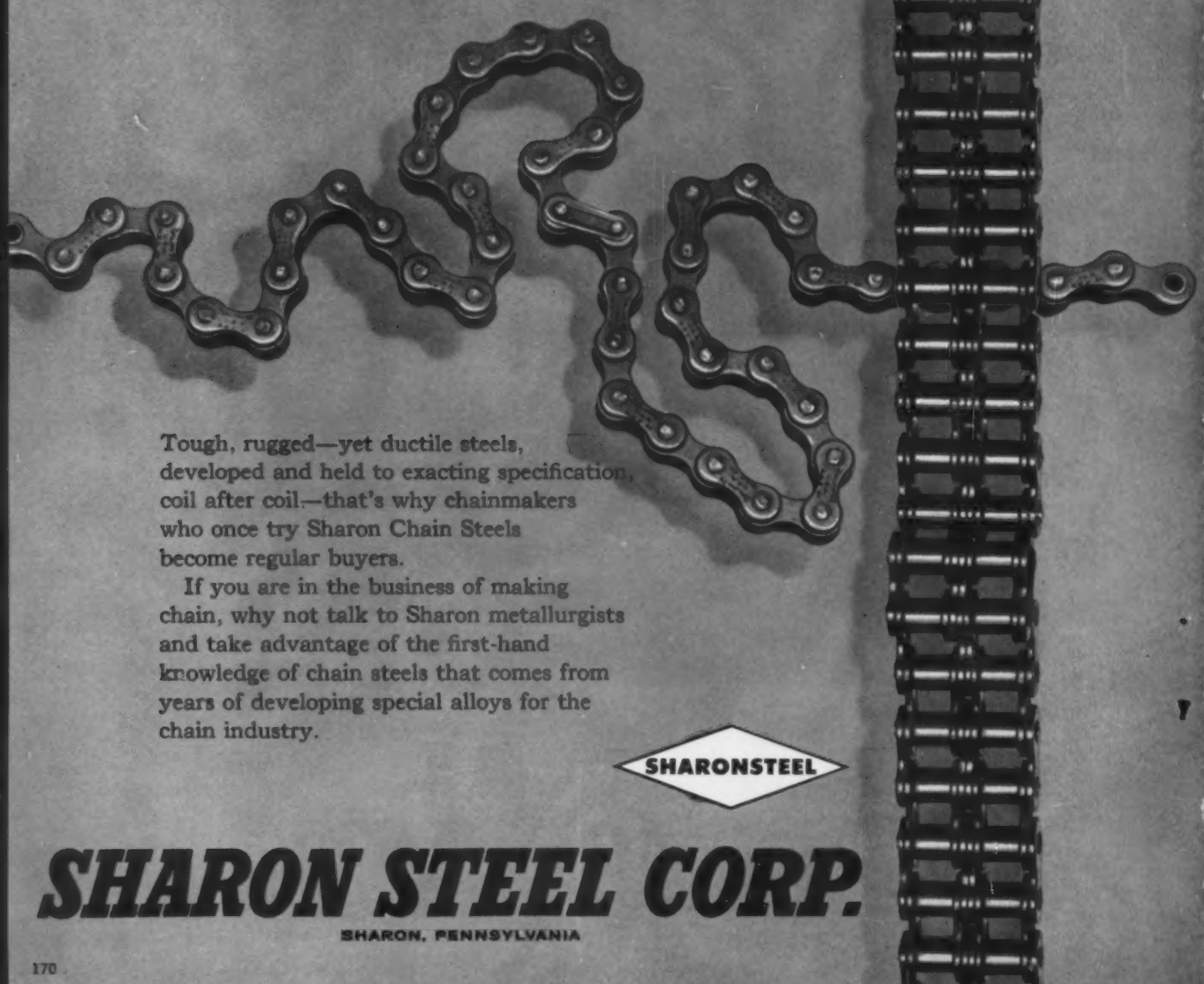

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Mr. Eisenhower's Forecast: His Critics Aren't Infallible

Right now it's fashionable to attack Mr. Eisenhower's forecast that things will pick up by mid-year. Many of his critics take the President to task because he tried to pinpoint the "turn."

A lot of other people profess to see his "chin up" talk as ethereal, vague, and upsetting. Others think it is the right approach if the Government tries to prevent a nose dive.

Forgetting for a moment how much the Government can or can't do to prevent us from making asses of ourselves, let's look at Ike's position. It is fairly good: His economic advisors have the same tools his critics have. So it's a matter of opinion. His opinion then is as good as the next fellow's.

If Ike hadn't said anything he would have been panned. Now that he has said he looks for a pick up he is called a Pollyanna. Some of those who have attacked his viewpoint did it to get their names in the paper.

It is easier to get publicity by attacking things than it is by praising things. Many people have made an art of this. It seems that the sadist in all of us applauds and relishes attack more than agreement.

No one in his right mind expects that we will always have boom times. Nor do most of us believe that depressions will never recur. But there are many reasons why the present severe recession — severe when measured against the highs of late 1956—should be at bottom soon. There are other reasons why a slow upward movement should develop before the year is out.

It's true there will be grim reading in the financial pages in the next few months. Much of that news will apply to January, February, and perhaps part of March. Most of the really bad news is behind us—or at least we are getting it now. What's ahead should be at least less frightening than what we have seen already.

Services are holding up, retail sales are doing well, government spending is higher, defense contracts will rise rapidly this year, unemployment is less proportionately than it was in 1954, home building has started up—and our hysteria is reacting to a little common sense.

The bulk of the trouble is in the durable or capital goods. Even there inventory correction has gone far: The next move will be up.

Ike has a lot on his side too. Don't sell him —or yourself—short!

Tom Campbell

Editor-in-Chief

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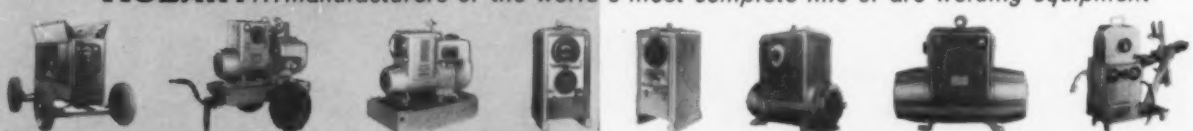

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Ferrous Castings

Sir—Congratulations on the wonderful feature on ferrous castings you published in your Feb. 13 issue. It is the most complete and informative article I have ever had the pleasure of reading.

I would like you to send me eight reprints of this article.—E. Rogoza, Chicago.

Sir—Will you kindly send me a reprint of the article on how to get more for your casting dollar which appeared in the Feb. 13 issue.

This article is very informative and should prove extremely useful in our purchasing department.—T. B. Rees, Mgr., Plant Purchases, The M. W. Kellogg Co., Jersey City.

Sir—I wish to congratulate your organization for the recent very well-written special feature on ferrous castings. For many years our industry has needed an article of this kind made available to purchasers of all kinds of metal parts.

Every high school library in these United States would have a large increase of interest if a paper like this one could be easily found among its shelves.

Would you please send me a reprint of the article if any are still available. — E. M. McCausland, Vice Pres., Hyde Park Foundry & Machine Co., Hyde Park, Pa.

▪ Copies are on the way.—Ed.

Exec Rating

Sir—Regarding the article, "How to Rate Executives" in the Jan. 30 issue of the IRON AGE, I am very much impressed with this approach to a knotty and tremendously important problem of industrial management.

Three reprints of this article would be appreciated. — L. M. Hedges, Supt.—Aviation Products, Johns-Manville Products Corp., Manville, N. J.

Cost Cutting

Sir—We at the Jenn-Air Products Co. recently read in your Dec. 12 issue three articles entitled "How To Plan For Lower Costs" (p. 97), "Where To Look For Biggest Cost Savings" (p. 98), and "Setting Up A Sound Cost Control Program" (p. 100). We have three requests for copies of the Dec. 12 issue or reprints of the above reports.

Thank you for sending them to us.—D. E. Poinsette, Dir. of Purchases, Jenn-Air Products Co., Inc., Indianapolis.

Sir—Your article on "How To Run a Cost Cutting Program" is very excellent in that it depicts the fundamentals of cost cutting. Please send me two copies of the article.—T. A. Ward, Industrial Engr., Hoof Products Co., Chicago.

Capacity Info

Sir—Please send a reprint of the Steel Capacity data which appeared in the Feb. 13 issue of The IRON AGE. It's an excellent tabulation of interesting information and I am looking forward to receiving the reprint.—R. C. Coonrod, Pittsburgh.

"What's going on? This is the third box of cigars our scrap buyer has sent over for you."

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FATIGUE CRACKS

Happy Men

When Lee Wilson Engineering Co. recently turned out its 500th high convection single stack annealing furnace the event represented an important milestone.

Helping celebrate the occasion (see cut) were James L. Whitten, vice president and general manager; Lee Wilson, chairman of the board; and Floyd Olmsted, president. We'd say they have plenty of which to be proud.

The furnaces represent 85 pct of all single stack, radiant fired furnaces in existence. And you'll find them in steelmaking centers around the world.

What's more, engineers at Lee Wilson have developed many of the annealing furnace features regarded as standard today. Among successful innovations they pioneered are: radiant heating with the "O" tube for maximum heat control, high convection for furnace efficiency, and a portable base designed to reduce installation and maintenance costs.

Lunar Lady

The ad read, "Financial backing needed by lady with complete design for ship for trip to the moon. Runs on ordinary gasoline." With tongue in check R. C. Beard, General Manager, C-B Tool Co., answered it.

Here are excerpts from the letter he received in reply:

"Dear Robert C. Beard,
i wish to thank you Personaly—For The Wonderfull Letter Which you Wrote to me, Dated Dec. 10-57, i do have Plans & Blue Prints to a Lunar Ship) Really a Space-Ship-Numbered x52) it is Pweered- By gasoline) which will only go- in gravity) and then by switching over to Dry compressed gas which will burn where there is no air) once you have Reached ip 100 miles- above the Earth, the ship s wt. will be ½ lb,becloise there is no air but on the MOON, there is some air at a Distance of 238000 miles-at the Speed of 5200 Miles Per-PH, you can Land on the MOON, in a Distance of 1 Day and-11-Hours the Ship will have Fuel to go &-come Back on) it can be Bilt, & ill garnteee it to go & return it) I am also a- Mechanical Engineer & Sincetest) & i no sPace & whot to Find- ip there) this may Seam Funny but- its facts which i can Prove, ill Find Some one Who can) i can bild it my Self, but i'd, need help on it, labor & Money) i figued 20000 Dollars, well ill Send it to you)

Best of Luck & Marry Christmas"

Termite TKO

Well, life certainly isn't always beautiful—even in the insect world. There's bad news for the termite population. A stainless steel shield, made of stainless supplied by Allegheny Ludlum Steel Corp., has been erected on a Greenwich, Conn. home to combat underground borings by termites.

It's high time, too. The subterranean pests account for millions of dollars worth of damage every year in 47 states. (In case you're curious, North Dakota is the only place where they don't have a foothold.)

More than 250 ft. of type 430 stainless is used in the shield.

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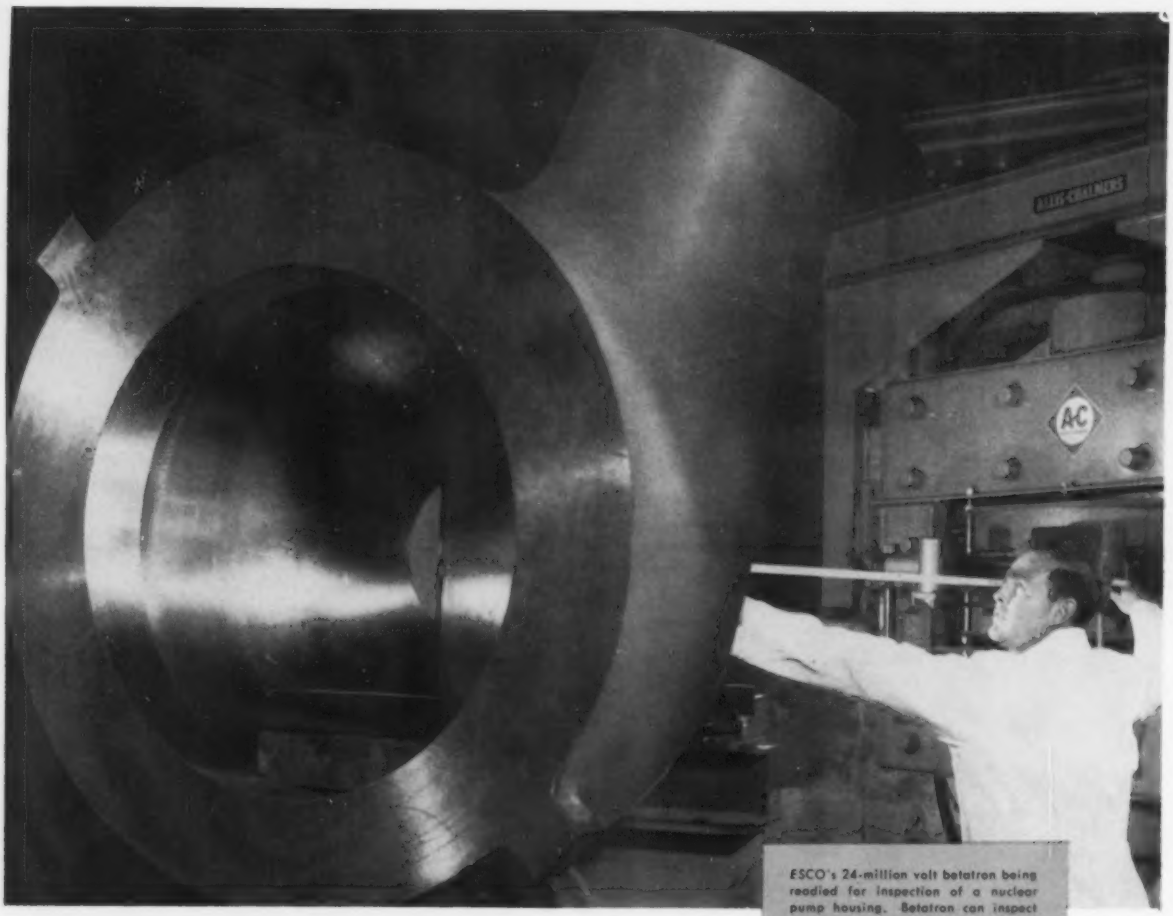

ESCO's 24-million volt betatron being readied for inspection of a nuclear pump housing. Betatron can inspect a six-inch steel wall section in 60 seconds, a 16-inch wall in 1½ hours.

design problems can be simplified with

ESCO'S nuclear casting know-how

Solving tough casting problems has always been *ESCO*'s specialty. And that's why *ESCO* has been furnishing nuclear castings right from the start of the atomic energy program. Nuclear casting specifications and inspection requirements are thoroughly understood at *ESCO*.

ESCO has the facilities, as well as the technical know-how, for critical, exacting, casting jobs. Centrifugal, shell or static casting methods produce castings weighing several tons, or less than a pound, in more than 90 steel alloys. Testing facilities include X-ray, gamma ray, spectrograph, zyglo, dye penetrant, magnetic particle and betatron inspection, as well as complete chemical and mechanical laboratories.

Make an appointment with an *ESCO* metallurgical engineer today. He may be able to simplify and help solve your designing problems.

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Offices in Most Principal Cities
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COMING EXHIBITS

Atom Fair '58 — March 17-21, International Amphitheatre, Chicago. (International Atomic Exposition, Architects Bldg., Phila. 3.)

Packaging Machinery and Materials Show — March 25-28, Convention Hall, Atlantic City, N. J. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

Industrial Development Show — Apr. 7-11, Coliseum, New York. (Woods, Donegan & Co., Inc., 48 West 48th St., New York 36.)

Design Engineering Show — April 14-17, International Amphitheatre, Chicago. (Clapp & Poliak, 341 Madison Ave., New York 17.)

Welding Show—Apr. 14-18, Kiel Auditorium, St. Louis. (Banner & Greif, 369 Lexington Ave., New York 17.)

Powder Metallurgy Show — April 21-23, Sheraton Hotel, Philadelphia. (Metal Powder Assn., 420 Lexington Ave., New York 17.)

Tool Engineers Show—May 1-8, Convention Hall, Philadelphia. (American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38.)

Southwestern Metal Show — May 12-16, State Fair Park, Dallas. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

MEETINGS

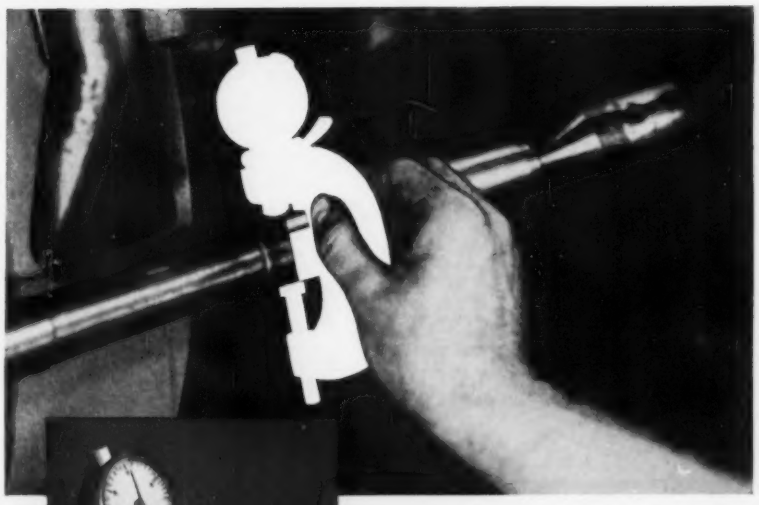
MARCH

American Machine Tool Distributor's Assn.—Spring meeting, March 10-11, The Roosevelt, New Orleans, La. Society headquarters, 1900 Arch St., Philadelphia, 3.

Press Metal Institute — Spring technical meeting, Mar. 12-14, Sheraton - Cadillac Hotel, Detroit. Society headquarters, 3673 Lee Rd., Cleveland 20.

National Assn. of Waste Material Dealers, Inc.—Annual convention

(Continued on P. 16)



Federal Model 1000 P

IF THE GAGE WASN'T THERE...

The only advantage in *not* using a gage at your machine belongs to your competitor! However, like the producer whose job we illustrate, you probably realize that the gage is being used where it can save the most money — as a *productive* tool — weeding out the scrap *before* further handling and machining add *needlessly* to the money you're spending on parts that ultimately will be junked. Not only does this gage indicate if the workpiece is acceptable, but it also shows any trend in dimension so the operator can make the required adjustments to his machine.

True . . . every plant discovers scrap parts before they get to the shipping room (almost always), but the surprising fact is that in so many plants they don't discover the useless parts when it counts most — *before* additional money is wasted on them.

The theory is simple but the choice of just what type of gage to get and just where to use it isn't always obvious . . . not if you want *maximum* results in terms of savings in production costs. That's where Federal comes in. Have a talk with your nearest Federal representative — see if what he suggests might mean real cost savings for you — as it has for so many. The benefit of his specialized experience is gratis and you can be sure that the gages he recommends will tell you accurately and reliably *what* you want to know. They've *earned* that reputation. For more on this subject, ask us for the booklet "Management Blind Spot" — it's worthwhile reading.

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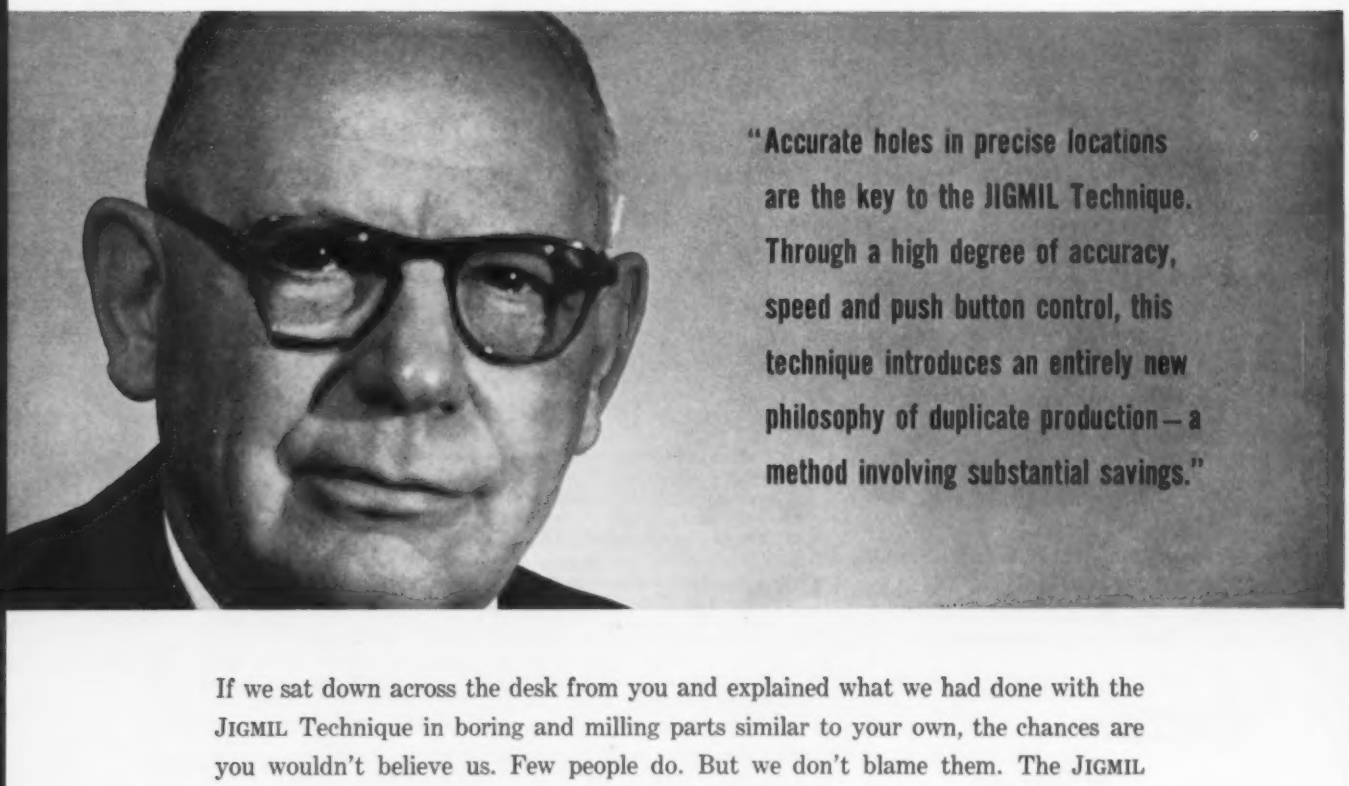
Ask **FEDERAL** *First*

FOR RECOMMENDATIONS IN MODERN GAGES . . .

Dial Indicating, Air, Electric, or Electronic—for Inspecting, Measuring, Sorting, or Automation Gaging

BEFORE THEY COME TO FAIR STREET

They tell us we are exaggerating...


"Accurate holes in precise locations are the key to the JIGMIL Technique. Through a high degree of accuracy, speed and push button control, this technique introduces an entirely new philosophy of duplicate production – a method involving substantial savings."

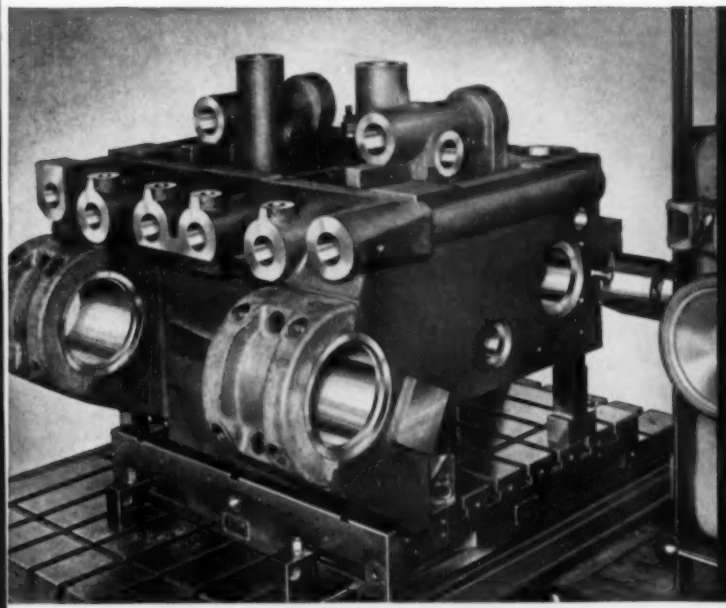
If we sat down across the desk from you and explained what we had done with the JIGMIL Technique in boring and milling parts similar to your own, the chances are you wouldn't believe us. Few people do. But we don't blame them. The JIGMIL Technique sounds too visionary. Savings seem too great. *Although simple, the* JIGMIL *Technique is so revolutionary that you have to see it to believe it.* Will you come to Fair Street (home of the JIGMIL) and see for yourself? We would be delighted to have you.

C. B. DE VLIEG

DE VLIEG MACHINE COMPANY 450 FAIR STREET

Some of Our Users in the Machine Tool Industry

Avey Drilling Machine Co.
Barber-Colman Company
E. W. Bliss Company
Brown & Sharpe Mfg. Co.
Buhr Machine Tool Co.
Cincinnati Milling Machine Co.
Cincinnati Shaper Co.
Cleveland Hobbing Machine Co.
Cross Company
Ex-Cell-O Corporation
Foote-Burt Company
Gallmeyer & Livingston Co.
Gisholt Machine Co.
Gleason Works
Gould & Eberhardt, Inc.
G. A. Gray Company
Hamilton Tool Co.
Heald Machine Co.
Ingersoll Milling Machine Co.
Jones & Lamson Machine Co.
Kearney & Trecker Corp.
King Machine Tool Div.
Landis Tool Co.
Landis Machine Co.
R. K. LeBlond Machine Tool Co
Lees-Bradner Co.
Lodge & Shipley Co.



A FEW PROVEN ADVANTAGES OF THE JIGMIL TECHNIQUE

- Eliminates cost of expensive jigs and production delays resulting from their manufacture.
- Simplifies tooling.
- Employs automatic functions to reduce factors of human error . . . even in close tolerance work.
- Makes possible greater flexibility of product design.
- Improves end product by permitting interchangeable assembly of parts without hand fitting.
- Increases production and product accuracy.

ACCURACY IS AN ECONOMY!

A TYPICAL EXAMPLE OF JIGMIL ECONOMY

At one setting! On four sides! Without the aid of jigs! This horizontal broaching fixture was completely machined—*bored* and *milled* to precise limits of accuracy. The JIGMIL Technique requires a minimum of tooling and technical skill to produce precision parts.

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Monarch Machine Tool Co.
Moore Special Tool Co., Inc.
National Acme Co.
National Automatic Tool Co., Inc.
National Broach & Machine Co.
National Machinery Co.
Oilgear Co.
Sheffield Corporation
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Sundstrand Machine Tool Co.
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OFFICES IN ALL PRINCIPAL CITIES

EXHIBITS, MEETINGS

(Continued from P. 13)

Mar. 15-18, Waldorf-Astoria. New York City. Society headquarters, 271 Madison Ave., New York.

Steel Founders' Society of America —Annual meeting, Mar. 17-18 Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland 13.

National Assn. of Corrosion Engineers—Annual conference and exhibition, Mar. 17-21, Civic Auditorium, San Francisco. Society headquarters, 1061 M&M Bldg., Houston.

International Acetylene Assn. — Annual spring convention, Mar. 19-21, The Bellevue-Stratford Hotel, Philadelphia. Society headquarters, 205 E. 42nd St., New York.

American Hot Dip Galvanizers Assn., Inc.—Annual meeting, Mar. 27-28, Penn Sheraton Hotel, Pittsburgh. Society headquarters, 1806 First National Bank Bldg., Pittsburgh.

American Society for Metals, The Golden Gate Chapter — Western welding, brazing and heat treating conference, March 27-28, Stanford Research Institute, Menlo Park, Calif. Information: Conference Sec'y—E. R. Babylon, Kaiser Steel Corp., 1924 Broadway, Oakland, Calif.

APRIL

Concrete Reinforcing Steel Institute —Annual meeting, Apr. 6-12, The Boca Raton Hotel, Boca Raton, Fla. Society headquarters, 39 S. Dearborn St., Chicago.

Wire Reinforcement Institute, Inc. —Annual spring meeting, Apr. 7-8, Hotel Boca Raton, Boca Raton, Fla. Society headquarters, National Press Bldg., Washington.

Industrial Fasteners Institute—Annual meeting, Apr. 8-10, Boca Raton Hotel, Boca Raton, Fla. Society headquarters, 1517 Terminal Tower, Cleveland.

we do **one** thing—

and we do it very well!

STRIP STEEL production is our specialty. From this you gain special benefits: experienced counsel on your strip applications...dimensional exactness...uniform quality, to speed product fabrication...the finish you want, in every coil. For superior quality and superior service in stainless, spring, alloy or clad metal strip steels *call Superior!*

Superior Steel

DIVISION OF

COPPERWELD STEEL COMPANY

CARNEGIE, PENNSYLVANIA

Why should you pay

for top quality in "Commercial Grade" Roller Bearings . . . AND NOT GET IT?

It's *wasteful* to pay for quality you don't need. It's *negligent* to pay for quality you don't get.

From the simplest steel-cage type to the finest segmented-retainer type, Rollway "commercial grade" Tru-Rol Roller Bearings incorporate as closely as possible design and construction principles found normally in a Rollway maximum-type precision bearing.

Take the segmented-type Tru-Rol for example. Each deep-section separator segment is formed to fit the curvature of the roller. Each roller has a separator segment to keep it in accurate alignment. And each roller is crowned to distribute load evenly along the full length of the roller.

That's a lot different from small-diameter, unground spacers staggered at unequal intervals, resulting in rollers rubbing in opposed-motion, and non-uniform roller distribution that can set up out-of-balance vibration and "pulse".

Let a near-by Rollway Service Engineer consult with you on your bearing problems No charge. No obligation. Just write us. Rollway Bearing Co., Inc., Syracuse, N. Y., *manufacturers of a complete line of radial and thrust cylindrical roller bearings.*

Cutaway view of Rollway Tru-Rol® segmented-retainer roller bearing . . one of three distinct types of Tru-Rol bearings available.

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Check This List AND BE SURE!

Retainer Operation

☐ Is the retainer roller-supported, to reduce sliding friction?

Retainer Construction

☐ Is the retainer strong enough to withstand shock loads and sudden reversals?

(A Rollway segmented-type steel retainer, such as that illustrated, is the strongest, most durable available in commercial grade bearings.)

Roller Spacing

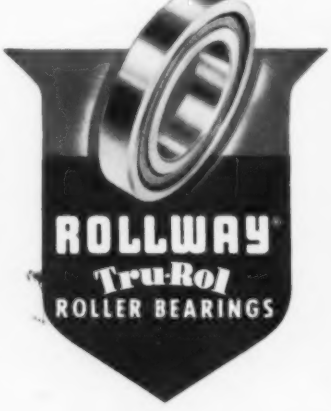
☐ Are all rollers equally separated, or do some rub against each other in opposed-motion friction?

☐ Are rollers distributed evenly to prevent "pulse" and vibration?

Roller Construction

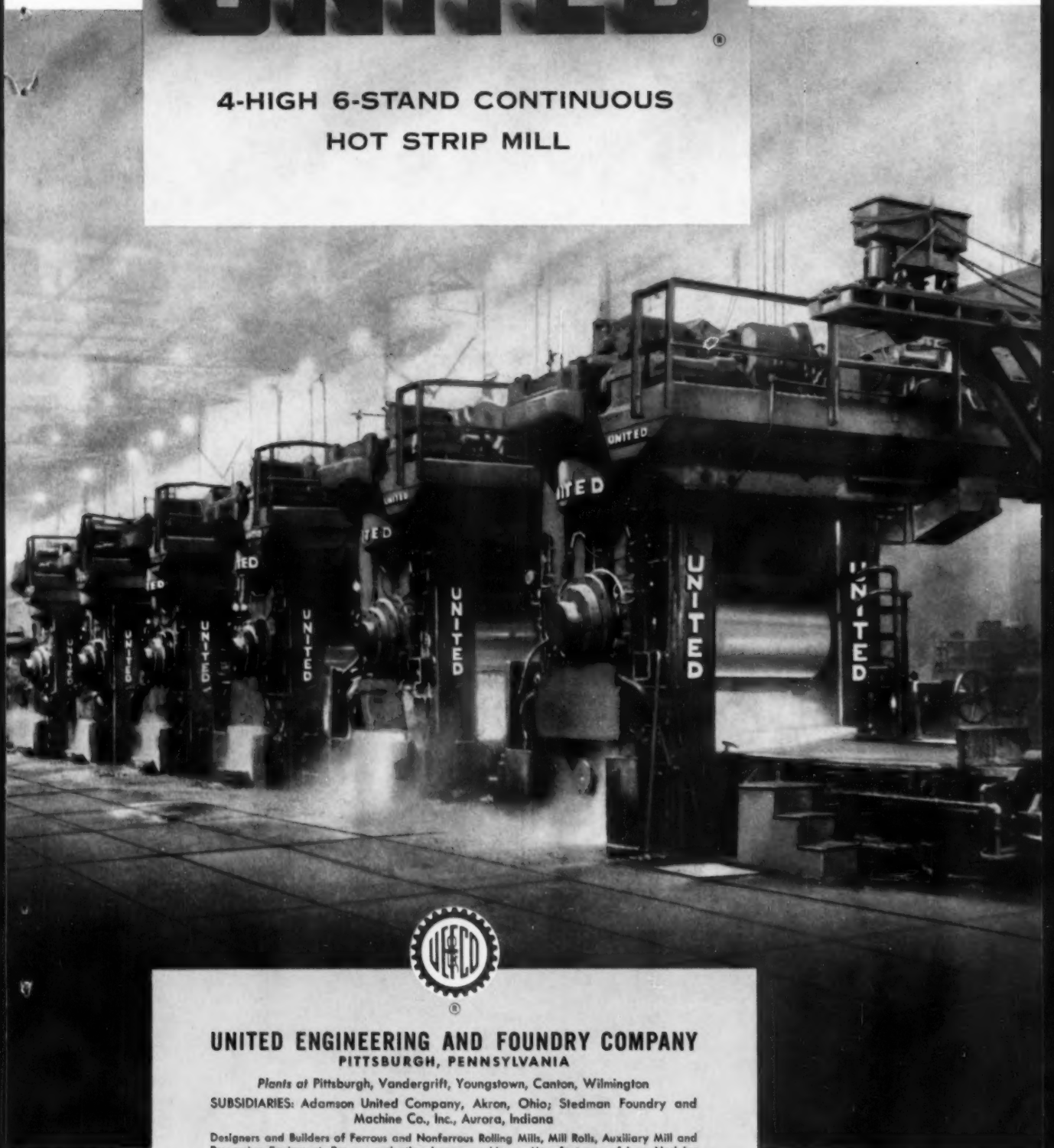
☐ Are the rollers crowned for optimum load distribution?

For Top Quality in Every Detail Buy Tru-Rol and Be Sure!



UNITED®

4-HIGH 6-STAND CONTINUOUS HOT STRIP MILL



UNITED ENGINEERING AND FOUNDRY COMPANY
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Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington

SUBSIDIARIES: Adamson United Company, Akron, Ohio; Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Short ton or a long ton. No need to be fussy about loading pickling equipment made of Monel alloy. It *stays* strong. And it's easy to fabricate in heavy structures like this pickling hook. Hook was designed and built by Youngstown Welding and Engineering, Youngstown, Ohio for Triangle Conduit and Cable Company.

After 8 years on the pickling line... this Monel hook is solid all the way through

There's certainty about the strength of a Monel* nickel-copper alloy pickling hook.

Take the Monel hook above. It's just as solid as it looks... all the way through. In fact, in this plant a Monel hook has given over eight years of continuous service in 6% sulfuric acid at 140° F. Only minor repairs.

What makes Monel pickling hooks different?

Monel alloy provides a unique combination of strength and resistance to corrosive attack from sulfuric acid pickling solutions. It's the strongest non-ferrous metal you can use for pickling. And it outlasts other materials many times over.

Because Monel alloy is strong, you can have pickling hooks that are lighter, carry greater loads with less deadweight. No need to allow extra metal to offset corrosion. And here's another saving: you can easily repair Monel alloy equipment after years of service.

Monel alloy is a natural for other pickling equipment, too

Monel slings, chains and tie rods are low in deadweight, tops in corrosion resistance and strength. And in fabricated equipment like baskets, crates and racks, Monel alloy's workability and easy welding properties really pay off. You'll find details about Monel pickling equipment in a 32-page illustrated booklet "Equipping the Pickle House for Greater Production at Lower Cost." For your copy, just write Inco.

*Registered trademark

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FABRICATING TOOLS

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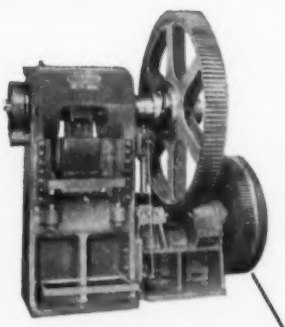
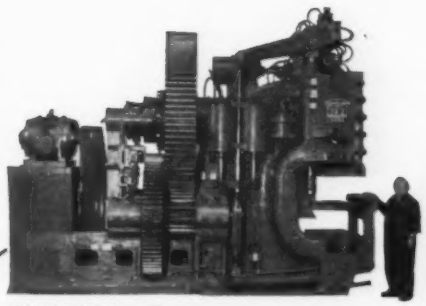
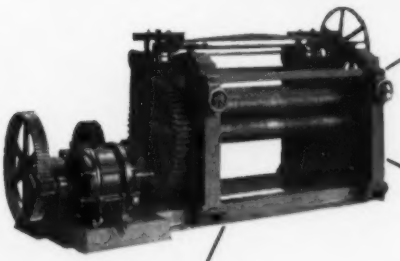


Bar Shears



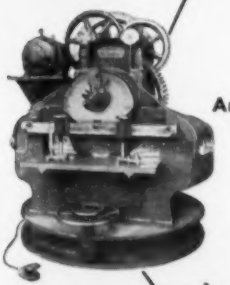
Vertical Open Gap Punching Machines

Horizontal Punches



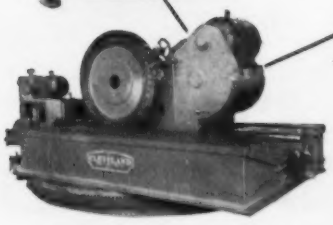
Straightening Rolls

Wall Radial Drills



Angle Shears

Bending and Straightening Machines



Rotary Planers

Bending Rolls

Ruggedly built for profitable production and simplicity of operation, Cleveland Fabricating Tools are designed for trouble-free operation and years of service.

This dependable, economical performance of Cleveland Fabricating Tools is a proven fact with leading shipyards, bridge builders, railroads, structural steel shops and boiler makers.

Since 1880, Cleveland has engineered its complete line of tools to be the finest, most efficient for punching, shearing, bending, coping and notching bars, angles, plates, I-beams and other structural shapes. Write for Folder FT48 to help you determine the correct fabricating tool for your needs.

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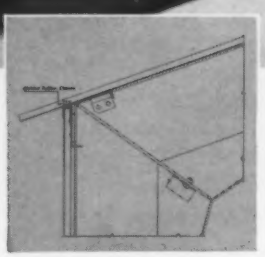
TRUSCON "BUDGET

Are Designed and Engineered for Fast,

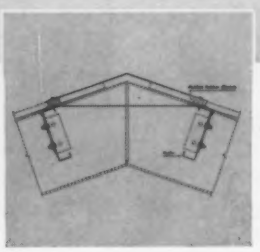
Top utility at lowest cost! That's the new Truscon Steel "Budget Building", designed to keep costs down and quality up!

Basic framework is of rigid frame design, shop fabricated from hot rolled structural sections, complete with all necessary connection plates and anchor bolts. Purlins and girts are cold formed channel sections, bolted with standard machine bolts.

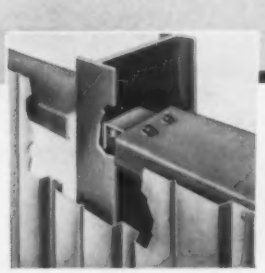
Roofing and siding are 26-gage galvanized roll formed ribbed sheets 24″ wide, and in continuous lengths. Sheets are rolled from Republic tight-coated,



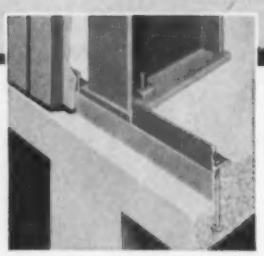
Section through eave showing molded rubber closure between siding sheet and roofing sheet. Also shown are eave strut connection and bracing connection to rigid frame.



Section through ridge showing molded rubber closure between rigid cap and roof sheet. Also purlin connection to rigid frame. Connections make building weathertight.



Section through sidewall at girt showing girt connection to rigid frame and fastening of sidewall to girt. Strong, sturdy building can be erected fast at the job site.



Section through sidewall at sill showing curb angle, rigid frame anchorage and siding detail. All connection plates, connection bolts and anchor bolts furnished complete.

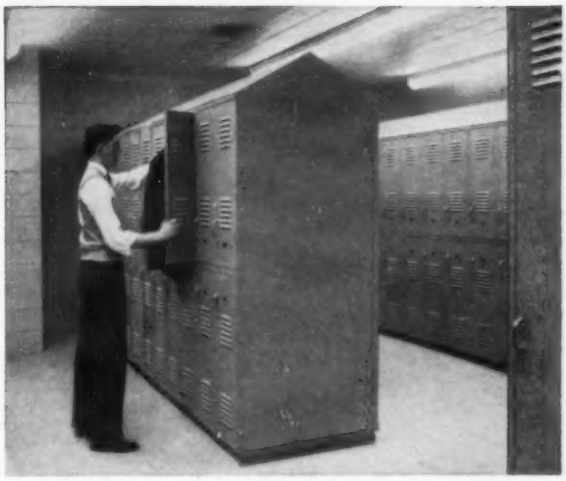
BUILDINGS"

Economical Job Site Erection

continuous hot dip galvanized steel . . . will not flake, crack or peel. More rust resistant than ever and no painting needed.

Truscon "Budget Buildings" are available for immediate delivery in widths of 32, 36, 40, 44, and 48 feet—12- and 14-foot heights, in any lengths necessary. Orders are filled fast from "off-the-shelf" stocks of pre-engineered materials. All roofing, siding, windows, doors and hardware are shipped to the job site as a package.

For additional information, send for attractive full color brochure, or call your Republic representative.



REPUBLIC STEEL LOCKERS are indispensable wherever clothing must be changed or stored. Safe, pilfer-proof, tamper proof. Wide selection of styles and locking mechanisms. Bonderized finish for lasting protection. And Republic's Berger Division will help you plan new or enlarged locker systems and installation details. Send coupon.

REPUBLIC ELECTRUNITE® E.M.T. offers several "the best costs less installed" advantages that mean significant savings in electrical raceway installations. "INCH-MARKS" simplify cutting and fitting, "GUIDE-LINE" keeps bends in correct plane, and "INSIDE KNURLING" makes wire pulling up to 30% easier. For additional information, write today.

REPUBLIC WEDGE-LOCK STEEL SHELVING is capable of exceptionally high stacking. Patented Wedge-Lock construction means that the heavier the load, the tighter the grip. Wedge-Lock features a post that will not buckle, a reinforced shelf that does not sag and a concealed sway-proof joint. Unlimited shelf arrangements. Send coupon for facts.

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- ☐ Republic Wedge-Lock Shelving
- ☐ Republic ELECTRUNITE E.M.T.
- ☐ Republic Steel Lockers

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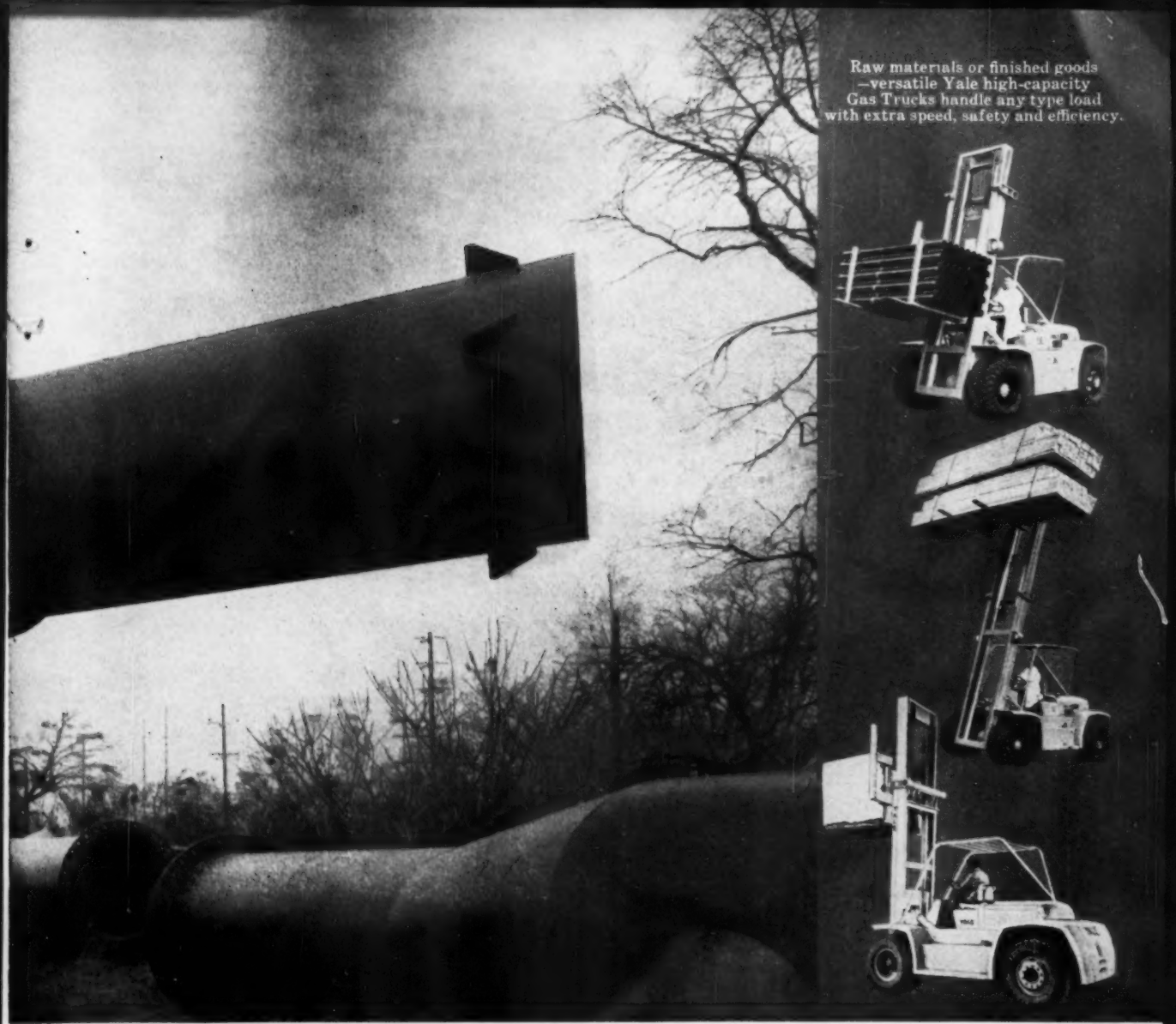
Ambrose-Augusterfer Corporation has been awarded the contract for all major piping in Torresdale Filter Plant —now under construction in N.E. Philadelphia. Pipe being handled weighs over 10,000 lbs. and measures 40′ by 54″ in diameter.

Only Yale G-3 Gas

1. Wide Angle vision
2. Fast cycle operation
3. Greater load stability

Now full visibility, extra safety and handling speed for efficient, big-load operations...at low cost


Raw materials or finished goods —versatile Yale high-capacity Gas Trucks handle any type load with extra speed, safety and efficiency.

Trucks give you all 3

Maximum visibility, easy maneuverability, high speeds, safe stability—you'll find the combination of all these vital features exclusively in new Yale G-3 Series High-Capacity Gas Trucks.

Wide-Angle Vision—Yale's revolutionary open-front design reduces frontal obstruction. Upright channels are nested—hoisting cylinders wide-spaced—lifting chains located in front of cylinders, out of line of sight. Driver sits high in center—has 300% more visibility!

Fast Cycle Operation—Yale G-3 Gas Trucks maneuver quickly into position ...lift capacity loads at speeds up to 60 feet a minute...travel as fast as 20 m.p.h....spot loads accurately. This fast, smooth operation keeps materials on the move, saves time and handling dollars.

Greater Stability—Low center of gravity, broad lifting base, high underclearance, side-thrust rollers, wide channel-roller spacing, large pneumatic tires—these and many other features that assure load stability are *standard* on Yale High-Capacity Gas Trucks.

Yale G-3 Gas and LP-Gas Trucks come in capacities of 15,000 to 20,000 lbs.—with fully automatic torque transmission, fluid coupling or standard transmission. Complete line available in capacities of 2,000 to 20,000 lbs.

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YALE MATERIALS HANDLING DIVISION, THE YALE & TOWNE MANUFACTURING CO. MANUFACTURING PLANTS: PHILADELPHIA, PA.; SAN LEANDRO, CALIF.; FORREST CITY, ARK.

ANOTHER INDUCTO INSTALLATION...

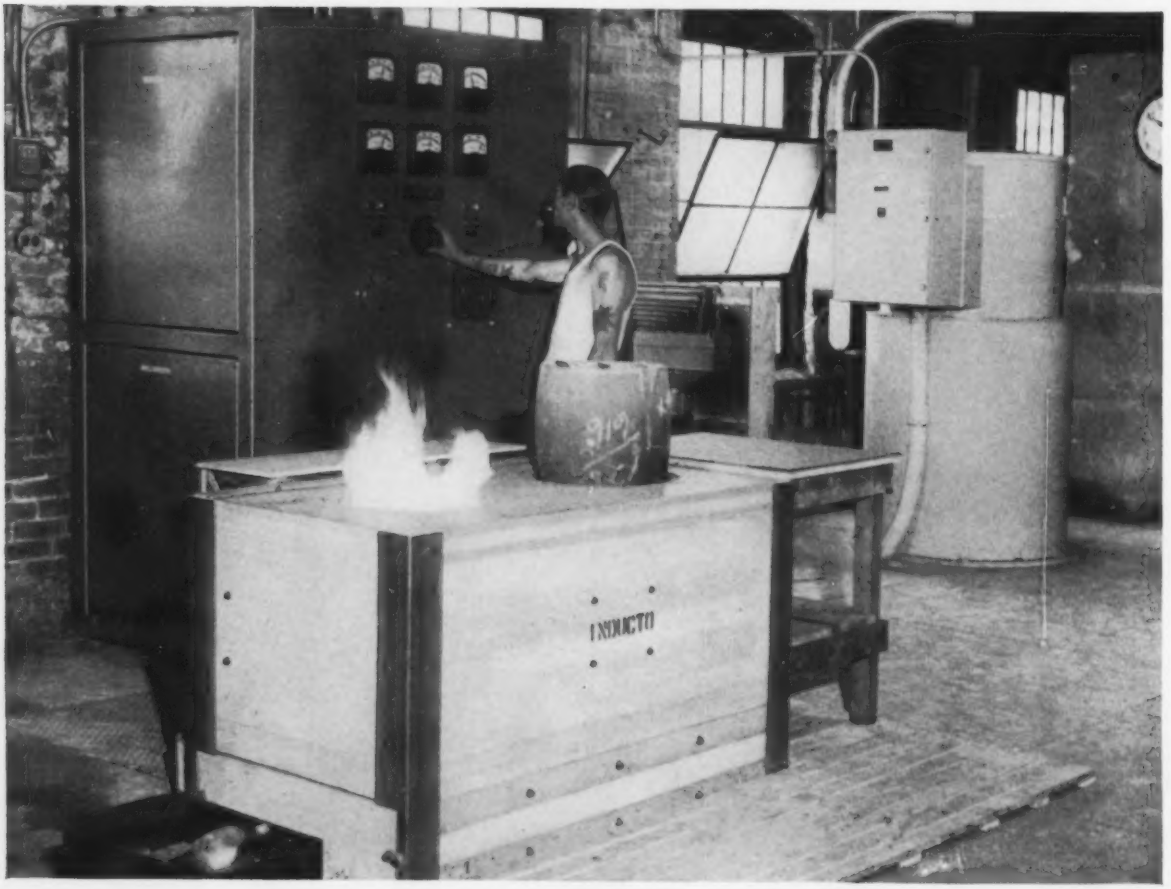


PHOTO COURTESY OF BUSHINGS, INC., PHILA. 32, PA.

The Foundry and the Feather Duster

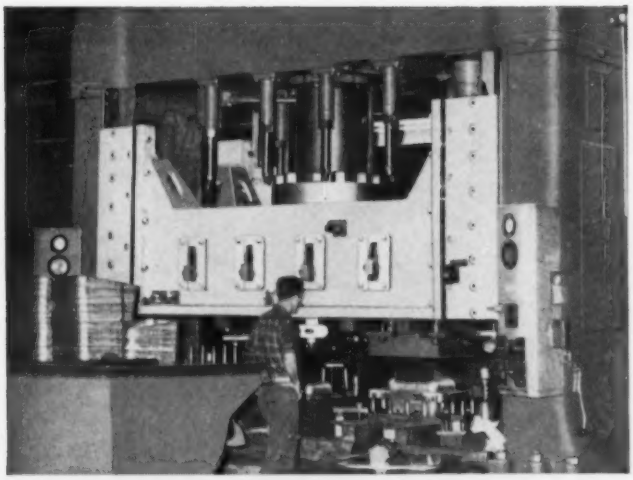
Shortly after Bushings Incorporated, a Philadelphia manufacturer of cast bronze bushings and bearings, replaced four oil-fired furnaces with an INDUCTO Push-Out induction furnace, the management received a strange request . . . the foundrymen wanted a feather duster. They liked the INDUCTO furnace and control so much, and were so pleased with the cooler and cleaner foundry, that they wanted a feather duster to keep the equipment clean.

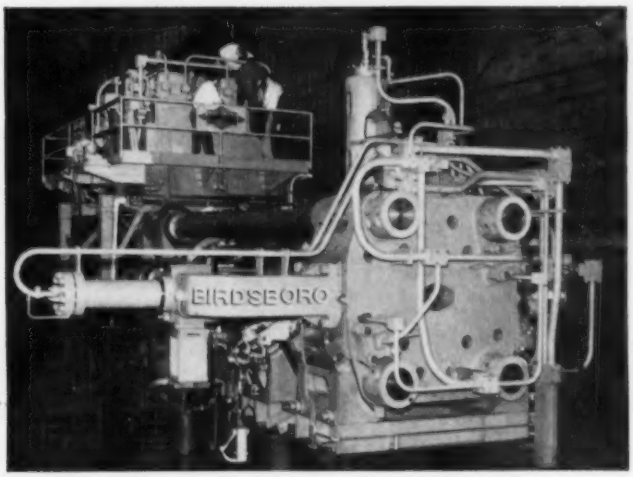
And the management was pleased too! For in addition to happier and more productive employees, they gained other benefits. The higher melting speeds and precision control of the INDUCTO Push-Out furnace helped reduce metal losses. In addition, it became possible to reclaim metal from melts and machining. Production time was saved in the handling of crucibles and the transferring of melts. In fact, the one INDUCTO Push-Out furnace provided as many melts in six hours as the four oil-fired furnaces did in eight.

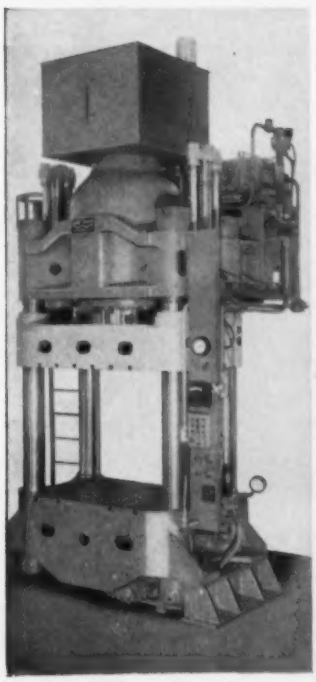
Why not learn for yourself how INDUCTO furnaces and precision control can help modernize your foundry and save production dollars? Write today for more complete details.

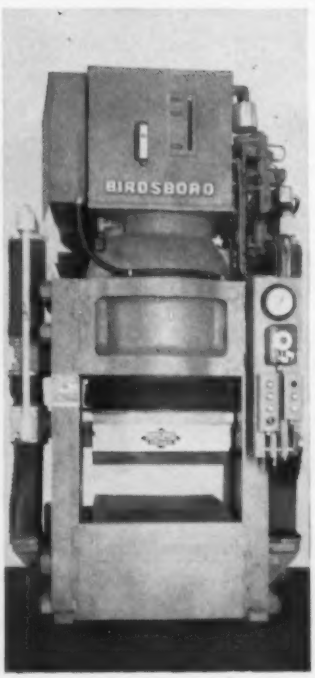
INDUCTOTHERM CORPORATION
INDUCTO

INDUCTOTHERM
corporation
412 Illinois Ave. Delanco, N. J.









new

Hydraulic Press design advances are produced consistently by BIRDSBORO experience

With any type of press job, Birdsboro has the engineering know-how and production experience to give you a customized job. From a wealth of background comes new design features in which Birdsboro engineers take pride. These are features that make possible new production savings in time and cost and insure product quality. A Birdsboro representative can bring you up to date on the latest developments. *Main Office, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

BIRDSBORO HYDRAULIC

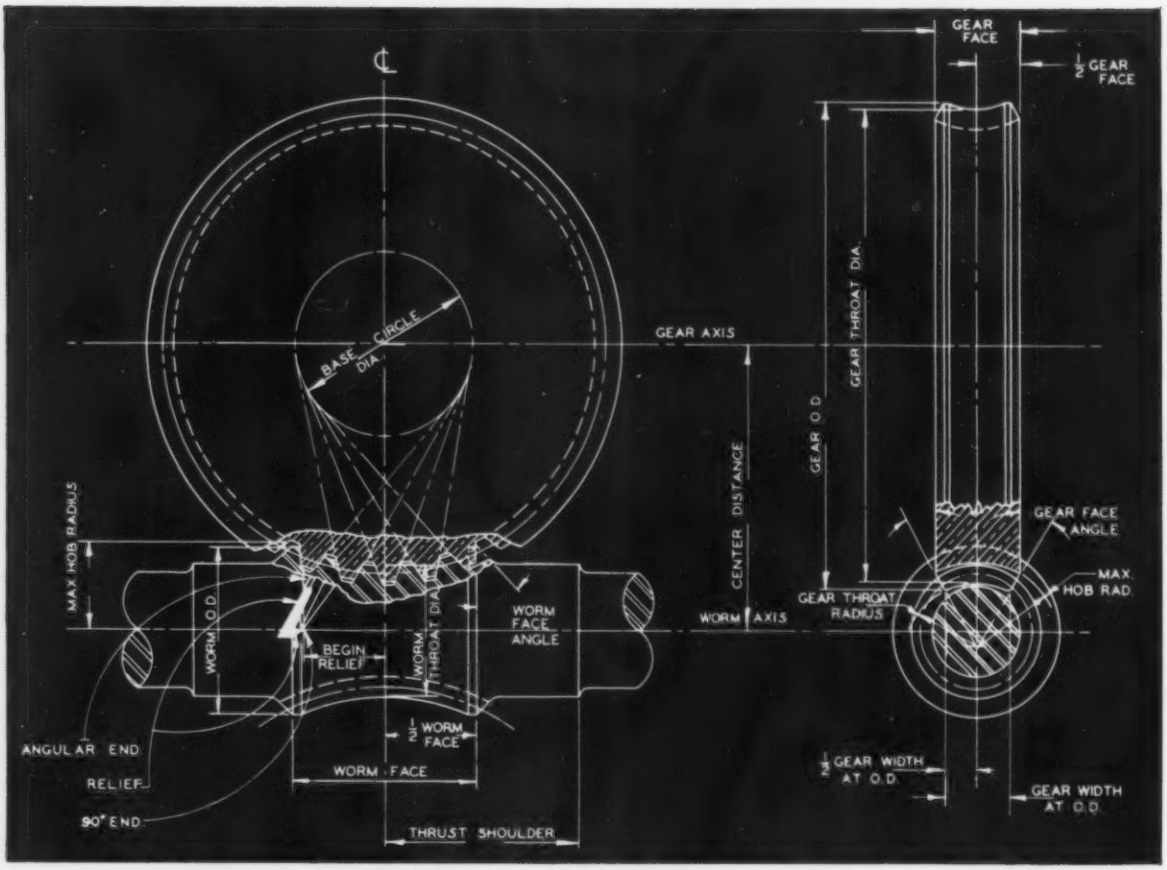
HP-33-58

BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

WORM GEAR DESIGN . . . *Bulletin #200*



Bulletin 200 has 20 pages crammed with 38 formulae, such as the Formula for Class I AGMA Horsepower Rating:

$$P = K_s K_m K_v \frac{n}{mg}$$

Step-by-step instructions, with typical examples, enable you to quickly determine the size worm gearset you need to meet any horsepower and service required.

You can calculate the bearing loads and sizes needed for the worm and gear shafts.

You can check the worm root stress and gear tooth stress.

Efficiency is charted against helix angle with modifications for required speed so you can quickly determine efficiency.

One quick look at the drawing above will convince even the uninitiated that no other worm gearset has so many teeth in contact. No other worm gearset is so simple to design and rate. No other worm gearset will carry so much load in so little space with so little weight.

Now, Bulletin 200 provides complete design and application data on space-saving double-enveloping worm gearing. Ask for it without obligation.

CONE-DRIVE GEARS DIVISION MICHIGAN TOOL COMPANY

7171 E. McNichols Road • Detroit 12, Michigan • Telephone: TWinbrook 1-3111

DOUBLE-ENVELOPING WORM GEARSETS | DOUBLE-ENVELOPING WORM GEAR SPEED REDUCERS | DOUBLE REDUCTION WORM GEAR SPEED REDUCERS | DOUBLE-ENVELOPING RIGHT ANGLE GEARMOTORS

A 3M Case History Report

33% MORE WELD GRINDING PRODUCTION WITH 3M TYPE "C" ABRASIVE DISCS

MANUFACTURER: American Radiator and Standard Sanitary Corporation

ADDRESS: Buffalo, New York

PRODUCT MANUFACTURED: Heating and plumbing components

3M ABRASIVE USED: Type "C" Abrasive Discs

HOW 3M ABRASIVES ARE USED: Removing excess spot-weld metal from cold rolled steel oil burner housings.

OPERATIONAL DATA ON 3M METHOD: Grit 50 Type "C" Discs, on portable grinders, are used to edge-grind spot-welded areas. Customer tested 3M and competitive discs in own shop by painting over backing to prevent identification, and using discs in actual production.

OPERATIONAL DATA ON PREVIOUS METHOD: A competitive brand of abrasive disc was used for the same operation.

PROVEN ADVANTAGES OF 3M METHOD: Operators ground 48 burner units with 3M Type "C" Discs, compared to 36 with competitive disc—got 33% more production out of the Type "C"

WANT MORE INFORMATION? Send for free manual, "Weld Grinding and Blending". Write to 3M Co., St. Paul 6, Minn., Dept. DD-38.

"3M" is a registered trade mark of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Export: 99 Park Ave., N. Y. Canada: London, Ont.

3M Coated Abrasives

TYPE "C" ABRASIVE DISCS

MINNESOTA MINING AND MANUFACTURING COMPANY
. . . WHERE RESEARCH IS THE KEY TO TOMORROW
3M COMPANY

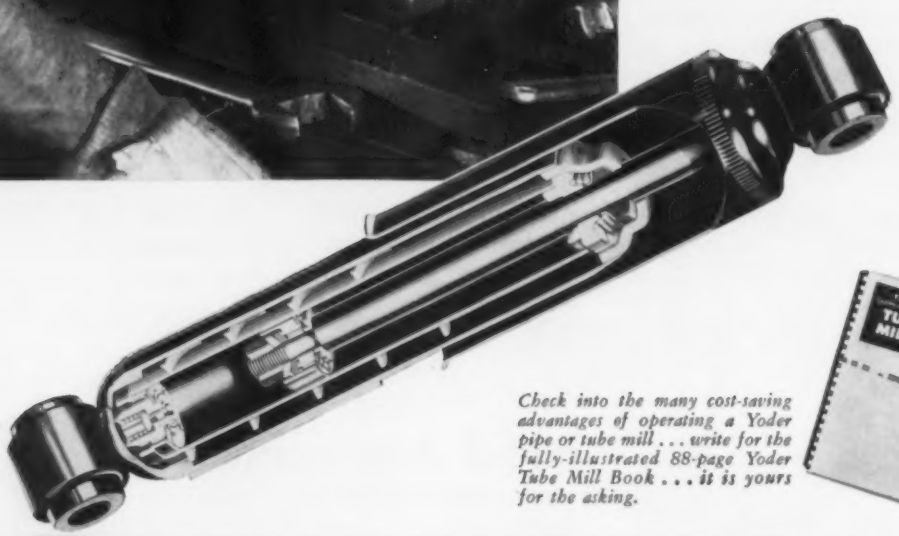
Monroe Shock Absorbers rely on performance of YODER Tube Mills!

After 15 years of continuous operation the Yoder Type-M Electric-Resistance Weld Tube Mill shown here, is still producing precision tubing for the Monroe Auto Equipment Co., Monroe, Michigan.

Yoder produced tubing is the basic component of the famous "Monro-Matic" shock absorber. Measuring 2 1/64" outside diameter (plus several other sizes) the tubing is made from 22 gauge strip in one continuous operation . . . it is automatically cold-roll formed, welded and cut to pre-determined lengths.

This typical installation of a Yoder tube mill exemplifies the accuracy, dependability and production economies of Yoder-made tubing. If your business requires pipe or tubing, ferrous or non-ferrous, in sizes from 1/4" to 26" diameters, there is a Yoder mill designed to produce it economically, efficiently and accurately.

THE YODER COMPANY
5510 Walworth Avenue • Cleveland 2, Ohio



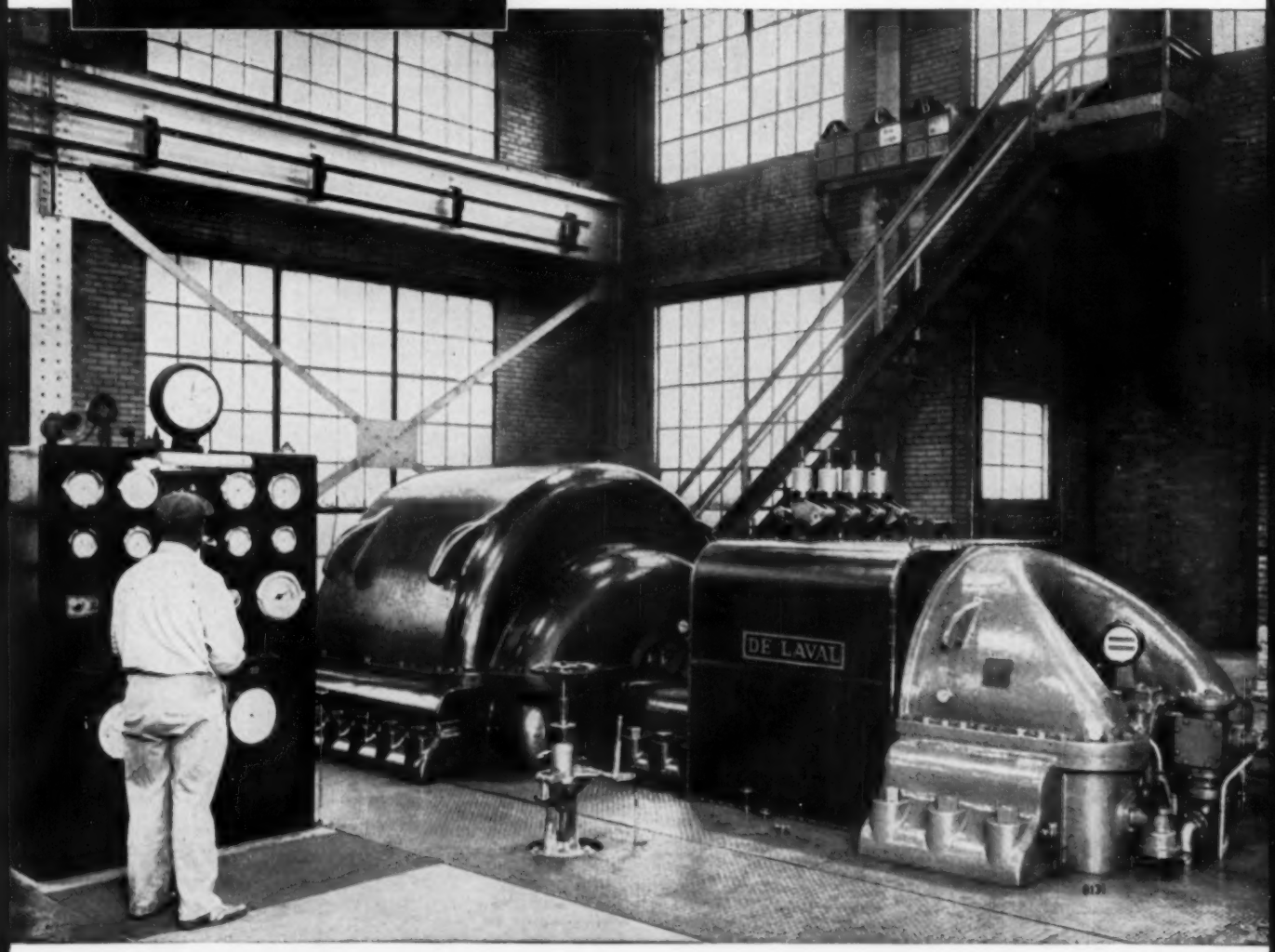
Check into the many cost-saving advantages of operating a Yoder pipe or tube mill . . . write for the fully-illustrated 88-page Yoder Tube Mill Book . . . it is yours for the asking.

ENGINEERING **YODER** MANUFACTURING

PIPE AND TUBE MILLS (ferrous or non-ferrous)
COLD ROLL FORMING MACHINES
ROTARY SLITTING LINES

DE LAVAL
BLAST FURNACE BLOWERS

give 20 years of service at Great Lakes Steel Corp.



Shown is one of two De Laval centrifugal blast furnace blowers at the Ecorse, Michigan, plant of the Great Lakes Steel Corporation, Division of National Steel Corporation. This 85,000 cfm unit was installed twenty years ago; another 75,000 cfm unit went on the line a year earlier. Both have given dependable round-the-clock service ever since. These turbine-driven blowers are hooked up to a multi-head which enables either one to be used in conjunction with any of the three blast furnaces.

De Laval centrifugal blowers are built in single and multi-stage types to supply air in volumes up to 150,000 cfm for all classes of service in steel, gas and coke plants. The wealth of application experience acquired by De Laval over the years assures a correct and economical solution to your blower problem.

Send for Bulletin 0504

DE LAVAL *Centrifugal Blowers*

DE LAVAL STEAM TURBINE COMPANY
899 Nottingham Way, Trenton 2, New Jersey

Variety
Economy
Quality

Johnson Standard Stock Bearings

You save time and money when you use Johnson standard stock bearings, but not at the cost of lowering tolerances or limiting freedom of design. Over 900 sizes of these bearings in over 200 combinations of inside and outside diameters are available in a number of lengths machined to exacting tolerances.

Your savings come from the economies of volume production and the elimination of tool and die charges. Time is saved because shipment is made from distributor stocks in your vicinity.

If you are not taking advantage of the economy and flexibility of Johnson standard stock bearings, write for full information including the name of your nearest Johnson distributor.

Johnson Bronze

505 South Mill Street • New Castle, Pa.

JOHNSON Bearings

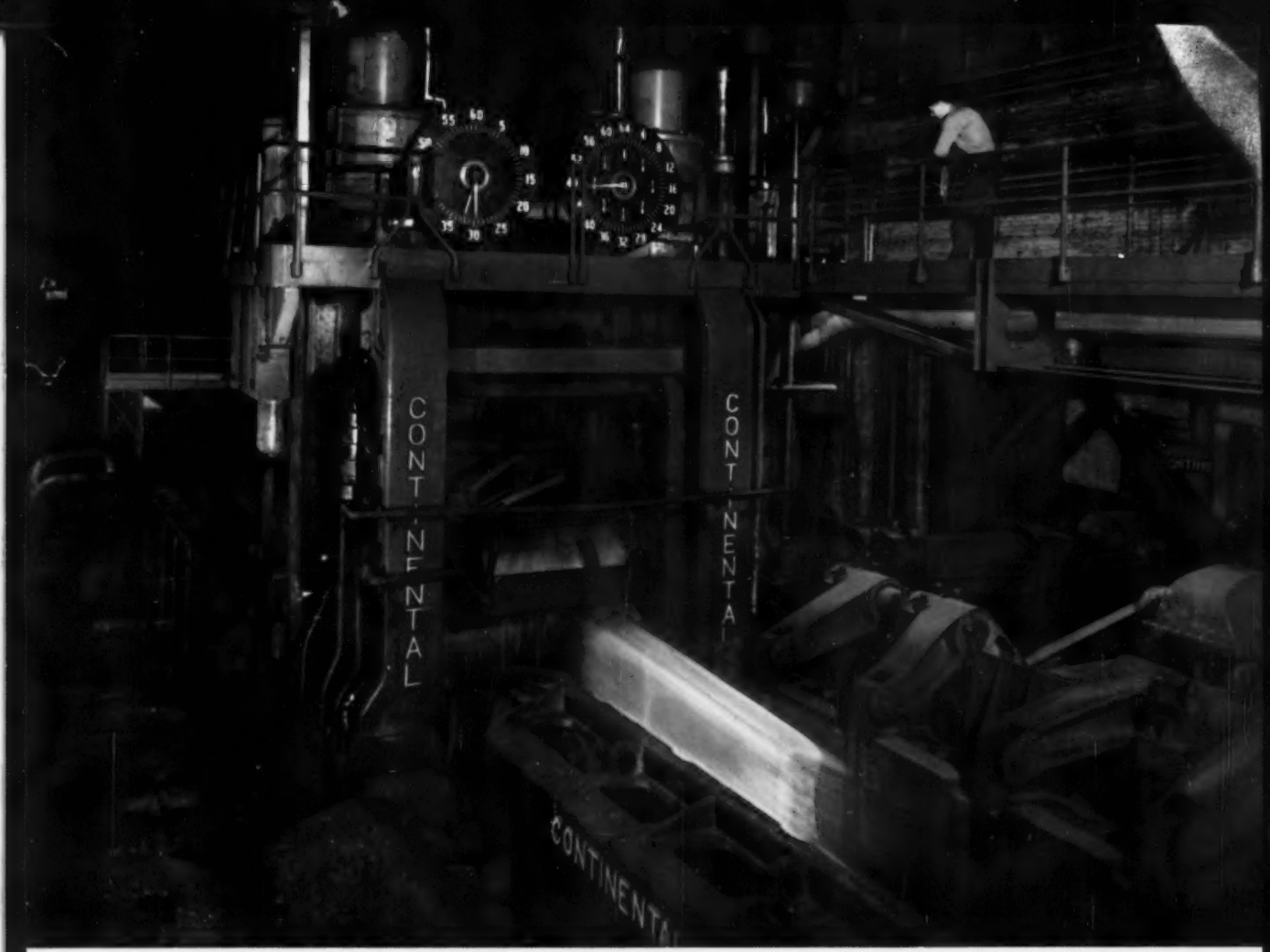
GRAPHITED
over 175 sizes

GENERAL PURPOSE
over 900 sizes

UNIVERSAL BRONZE BARS
over 400 sizes

LEDALOYL
over 500 sizes

ELECTRIC MOTO.
over 350 sizes



46-inch high lift slabbing-blooming mill

BLAW-KNOX SLABBING-BLOOMING MILLS

Blaw-Knox designs and builds slabbing-blooming mills in a complete range of sizes in high-lift and universal types. Other Blaw-Knox equipment for metals industry includes complete rolling mill installations including all auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron and steel rolls, Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings.

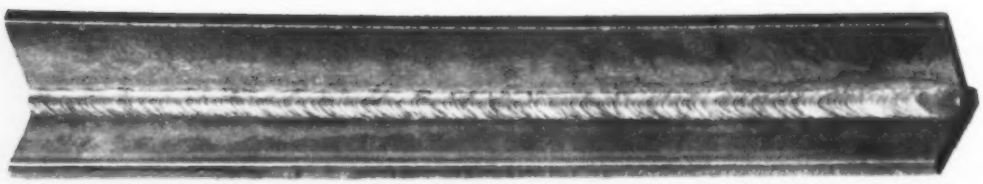
BLAW-KNOX

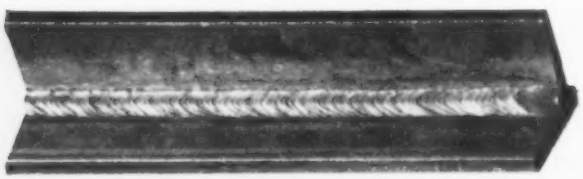
BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Now . . . another dramatic advance in electrodes

from **AIR REDUCTION . . .**





Over 90% Bonus!

This is the extra weld per rod you get with the new Airco Easyarc Stainless steel electrode

This is what you get with the conventional electrode

A NEW LOW-COST ELECTRODE FOR STAINLESS STEEL

New Airco Easyarc stainless steel electrodes produce over 90% more weld per rod . . . actually cost 29% less per pound than conventional stainless steel electrodes!

The new Airco Easyarc stainless steel electrodes are the first powdered-metal electrodes for stainless steel ever offered! They make possible *tremendous savings,* opening up possibilities for stainless use in many *new applications.*

You can weld practically *any* type of stainless steel with the new series. They are available as Easyarc 308, 316, or 347, the designations being equivalent to the type of stainless they weld. Restriking is instantaneous. Available in sizes from 3/32" to 3/16".

Order the new Easyarc stainless steel electrodes from your nearest Authorized Airco Dealer. Look for his name in the classified section of the telephone book under "Welding equipment and supplies." Or call your nearest Airco office.

welding
AT THE FRONTIERS OF PROGRESS YOU'LL FIND . . .

AIRCO

Offices and dealers in most principal cities

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated
150 East 42nd Street, New York 17, N. Y.

SEE IT AT THE WELDING SHOW

On the west coast — Air Reduction Pacific Company

Internationally — Airco Company International

In Cuba — Cuban Air Products Corporation

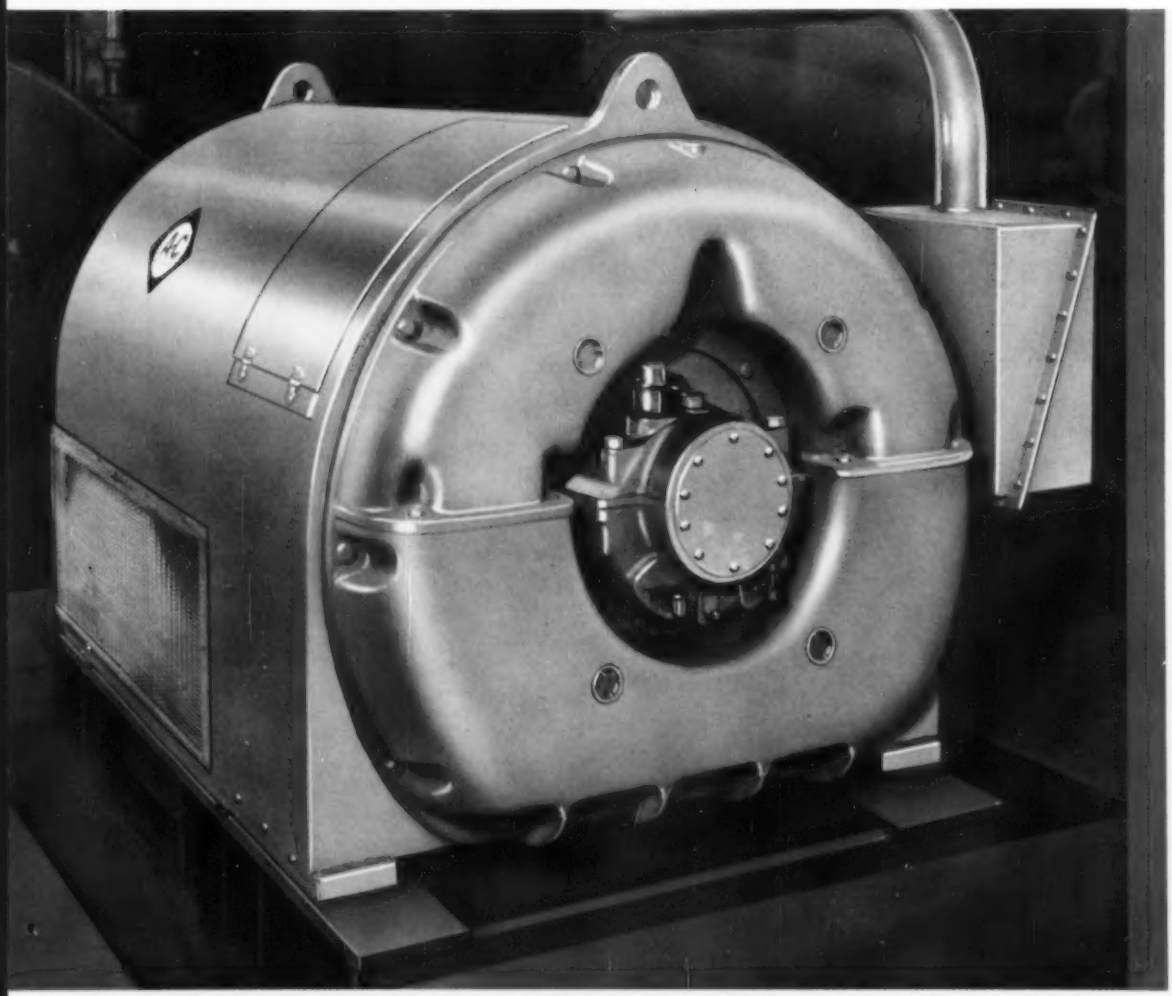
In Canada — Air Reduction Canada Limited

Products of the divisions of Air Reduction Company, Incorporated, include: **AIRCO** — industrial gases, welding and cutting equipment, and acetylenic chemicals • **PUREECO** — carbon dioxide — gaseous, liquid, solid ("DRY-ICE") • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON** — polyvinyl acetate, alcohols, and other synthetic resins.

Revolutionary Advance in Motor Protection

made possible by SILCO-FLEX insulation

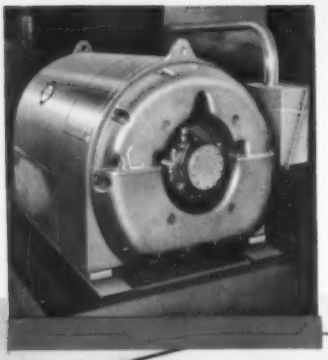
plus 10 integrated mechanical features



- **Designed to meet needs of chemical, paper, petroleum, metals, power and rock products industries where moisture, dirt, abrasive dusts or corrosive atmospheres are a problem.**

ALLIS-CHALMERS

A-5636



New Motor is

super-sealed

It's drip-proof — yet withstands moisture • abrasive dust • chemicals • high humidity • heat

The *Silco-Flex* system of insulation is used on all stators. Field coils of synchronous motors are bonded in heat-stabilized resins, enclosed in a resin-impregnated sheath of oriented glass fibers and bond-locked on the pole structure.

The superior electrical protection of Super-Sealed motors results from the insulating *system* used... not just the insulating material. The same material, conventionally applied, would retain certain weaknesses of conventional insulation.

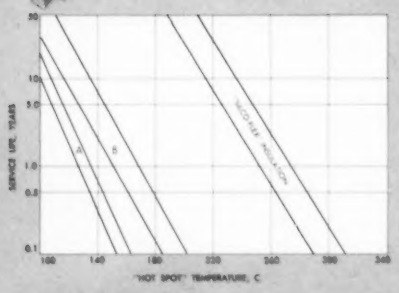
Applied the A-C way, it has these qualities that add reliability and service life:

Dimensionally stable — withstands heating, thermal shock, vibration and fatigue at elevated temperatures.

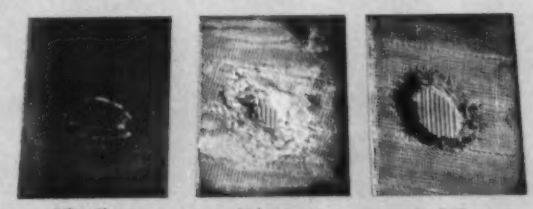
Sealed throughout — resistant to most chemicals, water, high humidity, weather, aging, corona and lubricants.

Homogeneous — provides a void-free dielectric barrier, homogeneous under extremes of differential expansion and contraction due to thermal cycling.

All Super-Sealed motors have revolutionary Silco-Flex insulation

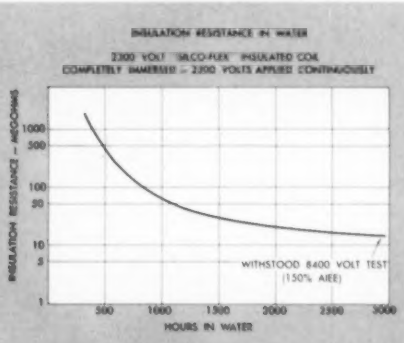


Heat resistant — *Silco-Flex* insulation gives much longer service life under higher temperatures than conventional materials.

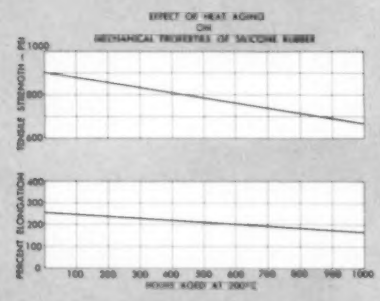


Silco-Flex Insulation | *Polyester Mica Tape* | *Asphaltum Mica Tape*

Abrasion resistant — Samples of insulation show effect after sandblasting for one minute with 90-grit aluminum oxide and 100-psi air. Nozzle to sample distance was six inches, thickness equivalent to 2300-volt insulation. Note difference in abrasion.


INSULATION RESISTANCE IN WATER
2300 VOLT "SILCO-FLEX" INSULATED COIL
COMPLETELY IMMERSED – 2300 VOLTS APPLIED CONTINUOUSLY
INSULATION RESISTANCE – MEGOHMS
HOURS IN WATER
WITHSTOOD 8400 VOLT TEST
(150% AIEE)

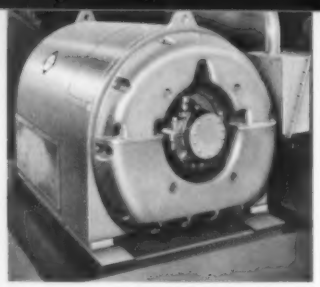
Moisture resistant — Test curve shows that *Silco-Flex* insulation, after 3000 hours of total immersion with 2300 volts impressed on coil, withstood high potential test of 8400 volts without injury.



Flexible, resilient — Rubbery *Silco-Flex* insulation remains flexible and resistant indefinitely. It is especially resistant to mechanical abuse and to stresses of overloading, rapid starting and stopping.

Silco-Flex is an Allis-Chalmers trademark.

ALLIS-CHALMERS



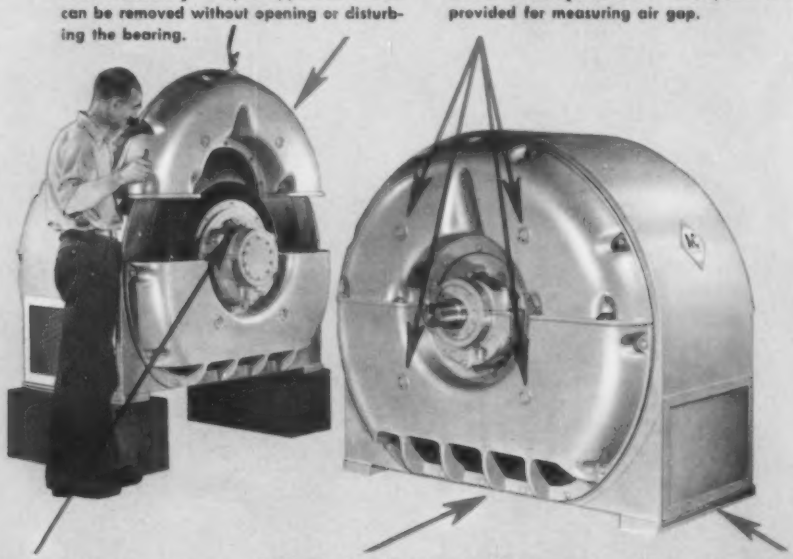
New Super-Sealed motors

10 mechanical features

Super-Sealed motors combine the perfect insulation with features that assure the mechanical as well as the electrical reliability of these motors.

Accessibility — Split-type end shields can be removed without opening or disturbing the bearing.

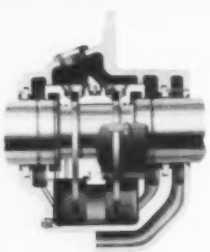
Ease of Inspection — Four points are provided for measuring air gap.



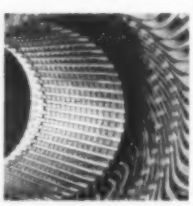
Clean Check — Glass inspection bulls-eye permits checking operation of oil rings without dirt falling inside bearing.

Full Circle of Protection — Steel plate across bottom of motor protects it from dirt and rodents.

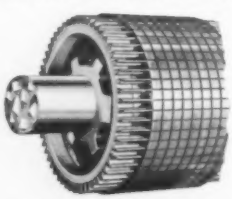
Clean Appearance — Foundation bolts are hidden, machine is clean-looking.



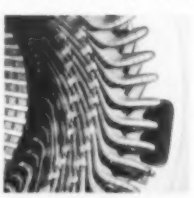
Self-Aligning Capsule-Type Bearings are center seated with single seat. Breather relieves pressure of oil in bearings that could cause leakage.



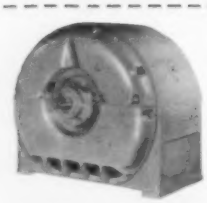
Precision Construction— Slot sticks are non-hygroscopic-trapezoidal, fabric base phenolic. End turns, spaced with polyester glass mat spacer pieces, are laced and tied with flat lubricated glass tubing for long trouble-free life.



Solid Construction—Silver-brazing rotor rods to end ring assures a good joint.



Rigid — End turns of higher speed motors are supported by insulated coil support rings to prevent injurious distortion due to high starting torque and frequent starting.



Timesavers—Separate plates provided to show direction of rotation and magnetic center. Terminal box is amply sized and diagonally split. Leads are brought out through grommet.

For the complete story, call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

First with NEW "Automatic" Service

Cone was the first builder of multiple spindle automatics to provide machine users with an experimental service in the application of carbide tools.

This service is a practical means of determining the possibilities of carbide tools for production men without loss or interference with their regular production schedules.

A pamphlet "FOUR STEPS WITH CONE" describes this service. Send for your free copy.

Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

How Earl Singleton cut the cost of

With 28 years experience in the abrasives industry, Bay State distributor Earl Singleton figures that one improvement in a grinding operation ought to lead the way to another. And, judging by the results he's produced, he's 100% right.

This is a good example of what happens when you tell a Bay State distributor your problem and give him a chance to experiment.

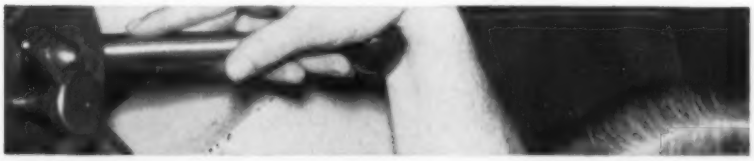
The problem: Grinding teeth on heavy traction gears for diesel locomotives at the Indianapolis plant of a large manufacturer of components for diesel locomotives.

The man: Earl Singleton, Abrasive Engineer at Browning Tool & Supply Co., Indianapolis.

Working with the foreman of the department, Singleton came up with a 14" grinding wheel that cost 14% less than the premium-priced wheel it replaced. It held form better, too, and so didn't need to be dressed as often.

That was fine. But Singleton figured they might also get more pieces per wheel if they used a slightly larger wheel. After exhaustive tests to ensure complete safety, a 15" wheel was put to work and wheel life was more than doubled . . . from 16-17 pieces to 35-36. Down-time was reduced, too.

Even if you seem to have no particular grinding problems at the moment, it's worth while getting acquainted with the Bay State distributor in your area. Like Earl Singleton, he may find ways to save you money that haven't occurred to the people in your shop. *Better grinding at lower cost – that is his business.*



grinding heavy traction gears

Bay State specification cut wheel cost 14% . . . *and* wheel held form so well that wheel life was doubled under regular production conditions.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities.

applied experience

by OSBORN

. . . start of an efficient foundry system

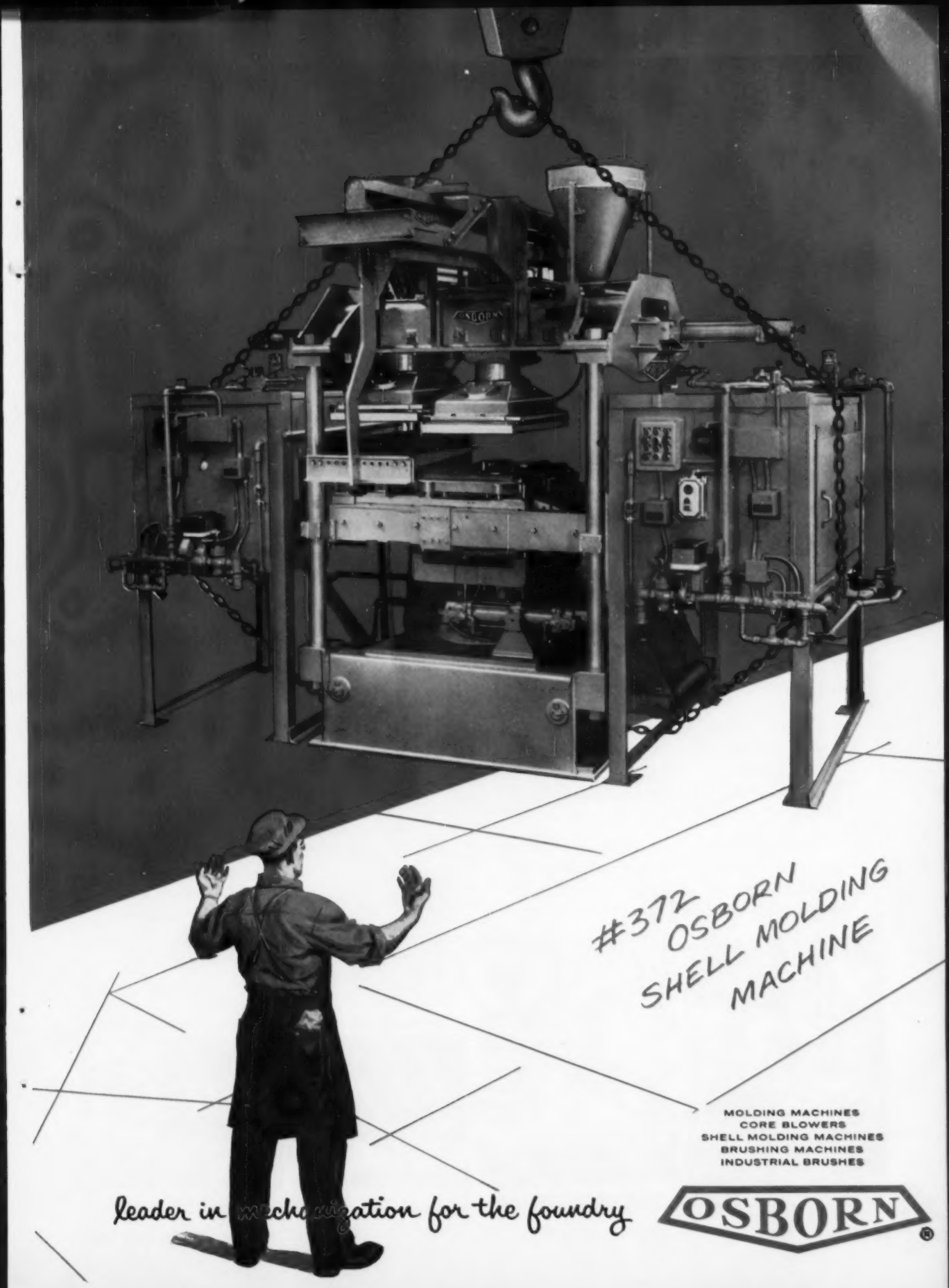
Operating a profit-producing foundry today takes a thorough knowledge of methods and equipment . . . it takes ground-level know-how to cut costs, speed production and still produce *quality* molds and cores. This is the kind of *applied experience* Osborn offers you—starting with an **O**sborn **M**ethods **S**tudy.

The time is *now* . . . when your foundry plans are in the "creative stage". It's the time to get the full benefit of Osborn's *advanced thinking* . . . advanced methods and equipment designed to *boost your foundry's efficiency.*

Call on Osborn . . . where a bonus of over 50 years *applied experience* and technical know-how can work together to help *lower your costs.*

At no obligation, our staff of Foundry Engineers will work with you . . . study your molding and core-making methods . . . help you develop the *best combination* to improve your foundry operations.

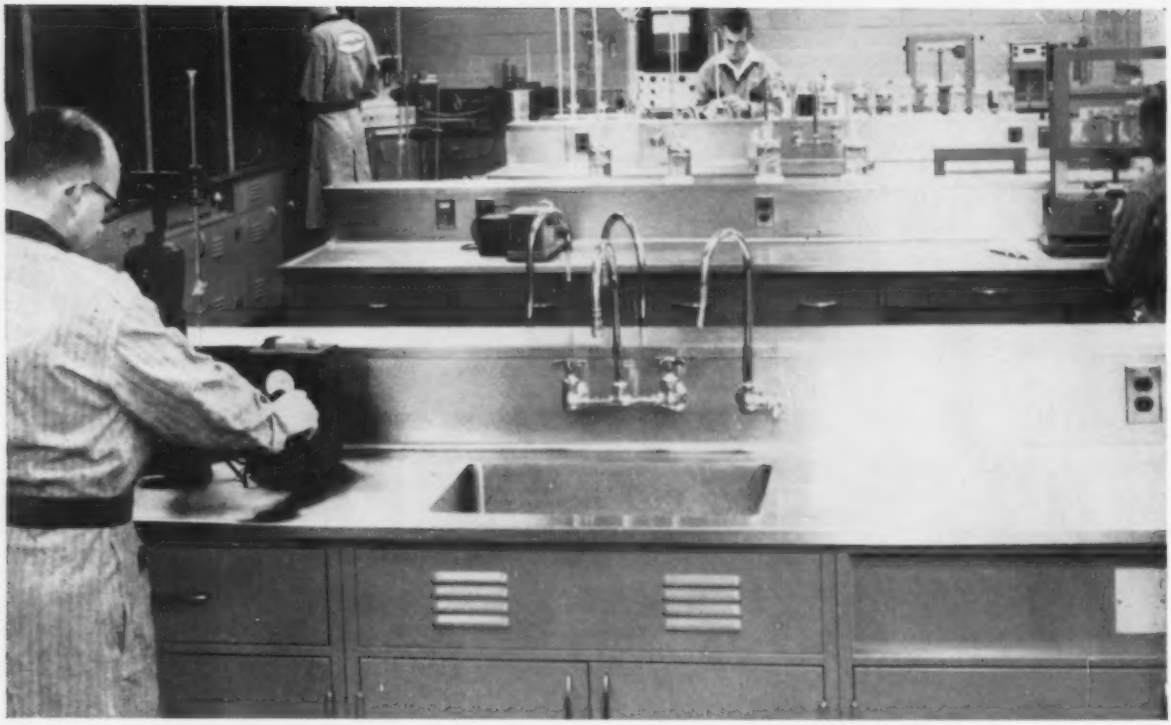
Write for full details. *The Osborn Manufacturing Company, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



MOLDING MACHINES
CORE BLOWERS
SHELL MOLDING MACHINES
BRUSHING MACHINES
INDUSTRIAL BRUSHES

leader in mechanization for the foundry

OSBORN®



Competitive "Acid Test" Selects Carpenter Stainless No. 20Cb

To find out which grade of stainless steel would hold up best under attack by highly corrosive acids, a large manufacturer put his laboratory to work. The best performer was then selected as the steel to be used in table tops and sinks throughout his new materials testing laboratories shown above.

Carpenter Stainless No. 20Cb showed less weight loss than any other steel when subjected to mixtures of hydrochloric and sulphuric acids. Attack of the sulphuric acid was so slight that the spots easily wiped off. This super corrosion-resistant steel will withstand a wide range of laboratory acids in many concentrations and under varying temperatures.

Carpenter Stainless No. 20Cb advantages will pay off like this on any equipment. Money-eating corrosion can be stopped immediately and new economies will be built into your product performance. It's available as tubing, pipe, sheet, plate, strip, bar and wire through your nearest Carpenter distributor. The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

MEMBER

Shearing and buffing Stainless No. 20Cb sheet used for laboratory table tops and sinks.

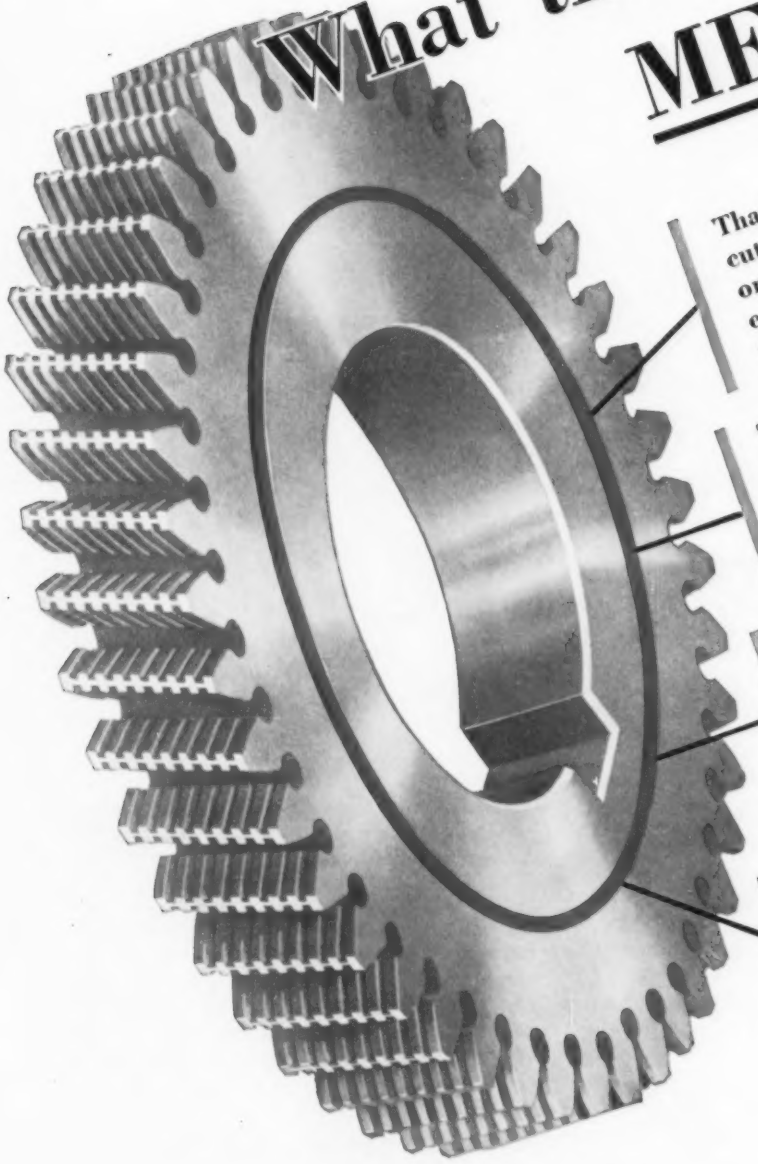
Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

more than corrosion resistance

Stainless No. 20 & No. 20Cb

What that Red Ring MEANS



That Red Ring on a gear shaving cutter means it was made by an organization which has more experience and success in this field than any other in the world.

That Red Ring marks the product of engineers and shop men who devote all their working time to these CUT-TERS — nothing else.

That Red Ring reminds the user that these specialists are ready to help him get off the hook if he runs into a troublesome gear problem.

That Red Ring says "This cutter is designed and manufactured to deliver the best possible shaving performance."

Write for bulletin CR 56-10

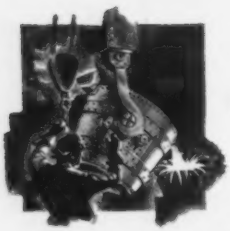
SPUR AND HELICAL GEAR SPECIALISTS
ORIGINATORS OF ROTARY SHAVING
AND ELLIPTOID TOOTH FORM

NATIONAL BROACH & MACHINE CO.

5600 ST. JEAN • DETROIT 13, MICHIGAN

7968

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT



AMERICAN ORIGINALS IN IRON AND STEEL

For exchange: A pig for a pot

In 1788, the founder of Vermont's iron industry, the Honorable Mathew Lyon, built a forge and furnace near Bennington.

In those days, coins were scarce and currency was of dubious value, but iron implements were highly prized. Products of local farms were also as welcome as money, so barter was the accepted practice. For this reason, the record tells us, it was not a strange sight to see a well-fed pig being led or dragged to the local forge to be exchanged for a plowshare or cooking pot.

Thus it was that, even in those early times, the iron furnace became the trading place . . . the industrial and commercial center.

Today, iron and steel production are still the heart of our nation's industry. And, as demands have increased, new methods and materials have helped improved steel's quality and increase its quantity.

Among such materials are Baker's Magdolite and Jebcolite . . . the original dead-burned dolomites. Both Baker's Magdolite, for open hearth use, and Baker's Jebcolite, for electric furnace use, provide greater furnace efficiency, more uniform ingots, and lower refractory costs. Both are superior in composition, preparation, strength, economy and quality.

Make sure you are using them.

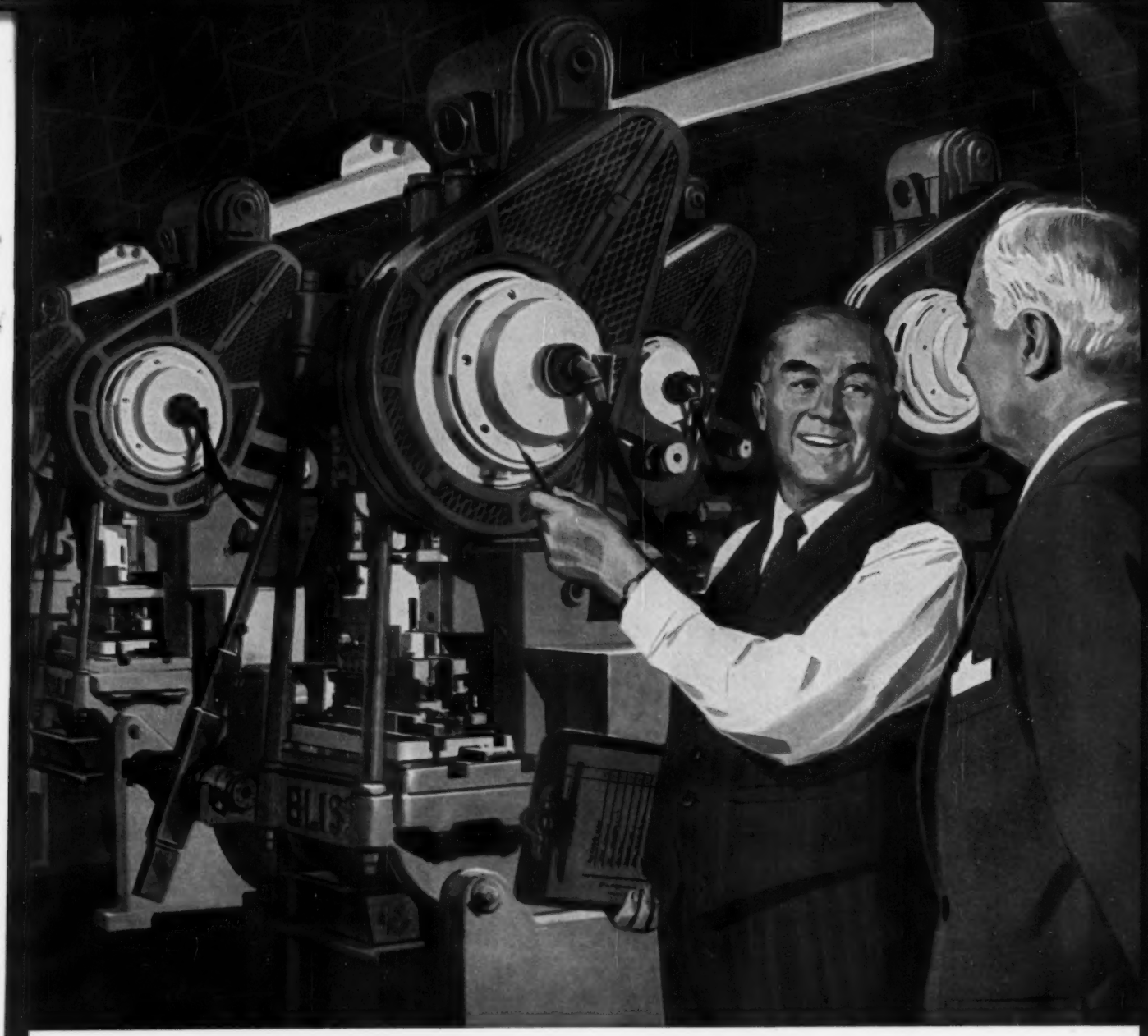
ANOTHER AMERICAN ORIGINAL

JEBCO
PRODUCTS
SINCE 1889

BAKER'S MAGDOLITE
The original dead-burned dolomite

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO



"These 'super-speed' inclinables give me twice the production . . . at about half the cost!" From their special vibration-absorbing legs to their counterbalanced shafts, these presses are built for speed.

With such special features as bronze gibs . . . automatic lube systems . . . special clutches, brakes and flywheels, and equipped with precision feeds, they can knock out short stroke work at better than 500 strokes a minute! They're all new, all Bliss, and the cost is low—surprisingly so.

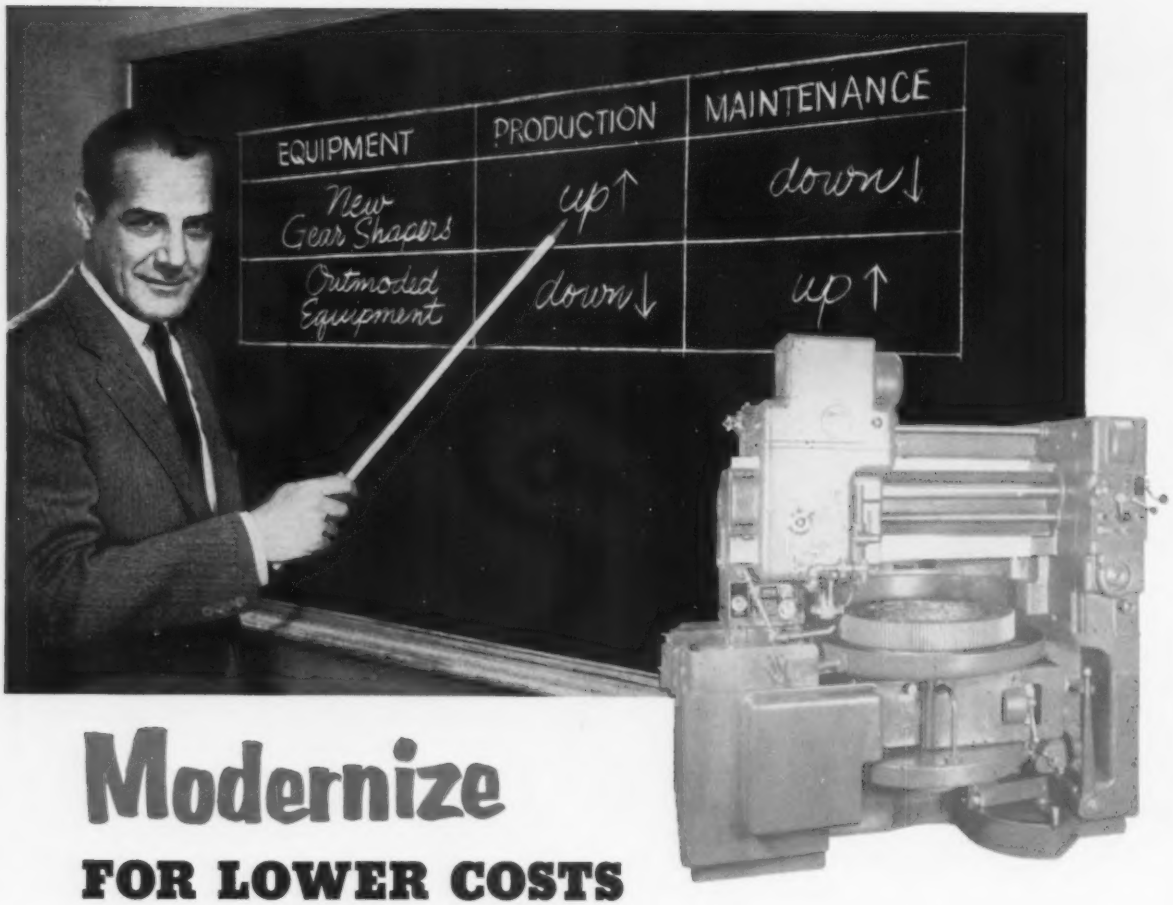
These are the latest members of Bliss' line—the line that offers industry its most complete choice of types and sizes. And with no axe to grind for any one type, you can be sure of impartial pressroom counsel—by Bliss.

BLISS
SINCE 1857

E. W. BLISS COMPANY · Canton, Ohio

100 years of making metal work for mankind

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CAN MACHINERY • CONTRACT MFG.



Modernize

FOR LOWER COSTS

with New Fellows 36-Type Gear Shapers

Two new Fellows 36-Type Gear Shapers can produce more than three or four older machines ...and give you extra production versatility, too. In many plants, new Fellows production equipment has lowered unit production costs by more than half, earned back its cost in three years or less.

Fast, accurate, and simple to set up for a wide range of jobs up to 36" pitch diameter, the Fellows 36-Type is ideal for short runs of varied parts as well as for long runs. Rigid, husky construction permits close tolerances on internal or external spurs, helicals, and herringbones, as well as an almost unlimited variety of cams, splines, and other non-involute shapes.

Why not ask a Fellows Representative to *show* you in your plant where you can cut production costs with newer machines? Write, wire, or phone any Fellows office.

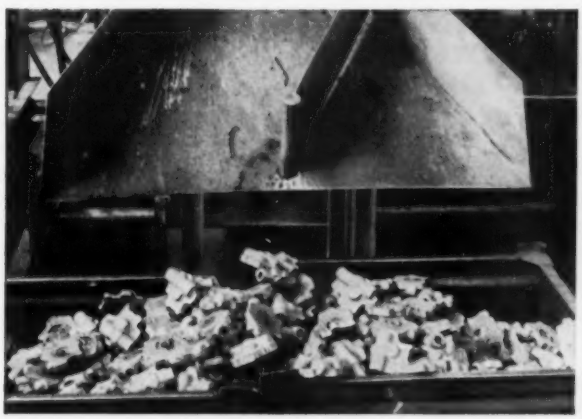
THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont

Branch Offices:
1048 North Woodward Ave., Royal Oak, Mich.
150 West Pleasant Ave., Maywood, N. J.
5835 West North Avenue, Chicago 39
6214 West Manchester Ave., Los Angeles 45

THE PRECISION LINE

Fellows *Gear Production Equipment*

DIRTY CASTINGS COME CLEAN



*Photos, courtesy Ajax Electric Company**

CHEMICALLY CLEAN WITH VIRGO® ELECTROLYTIC SALT

How Eaton Manufacturing saves up to 75% on salt for desanding

A short dip in this new, fully mechanized furnace, and castings come up completely cleaned for the Eaton Manufacturing Company.

Inside the furnace is a new desanding salt—Virgo Electrolytic Salt—which costs as little as one-fourth as much as comparable electrolytic cleaners.

This molten salt takes just 15 to 20 minutes to clean even the hard clinging sand, scale, graphite, and other surface impurities from iron and steel castings.

Because of this speed, the new Eaton furnace can handle up to 5400 gross pounds of castings per hour, heating them to 900° F. with 274 KWH/Hr. One man operates the entire furnace.

No acid dip. The Virgo Electrolytic Salt process requires no acid dip after rinsing. Of course, if other operations require it, you *can* use the acid treatment.

The bath's electrolytic action leaves all casting surfaces resistant to rust, helps *keep* them clean until further processing.

Samples tested. We have a bath set up in the Hooker laboratories, so you can prove for yourself how Virgo Electrolytic Salt can clean your castings—*for less money*. Write us about submitting samples for such test cleaning.

For technical data on the salt and the process, send us the coupon.

**Designers and builders of mechanized furnace.*

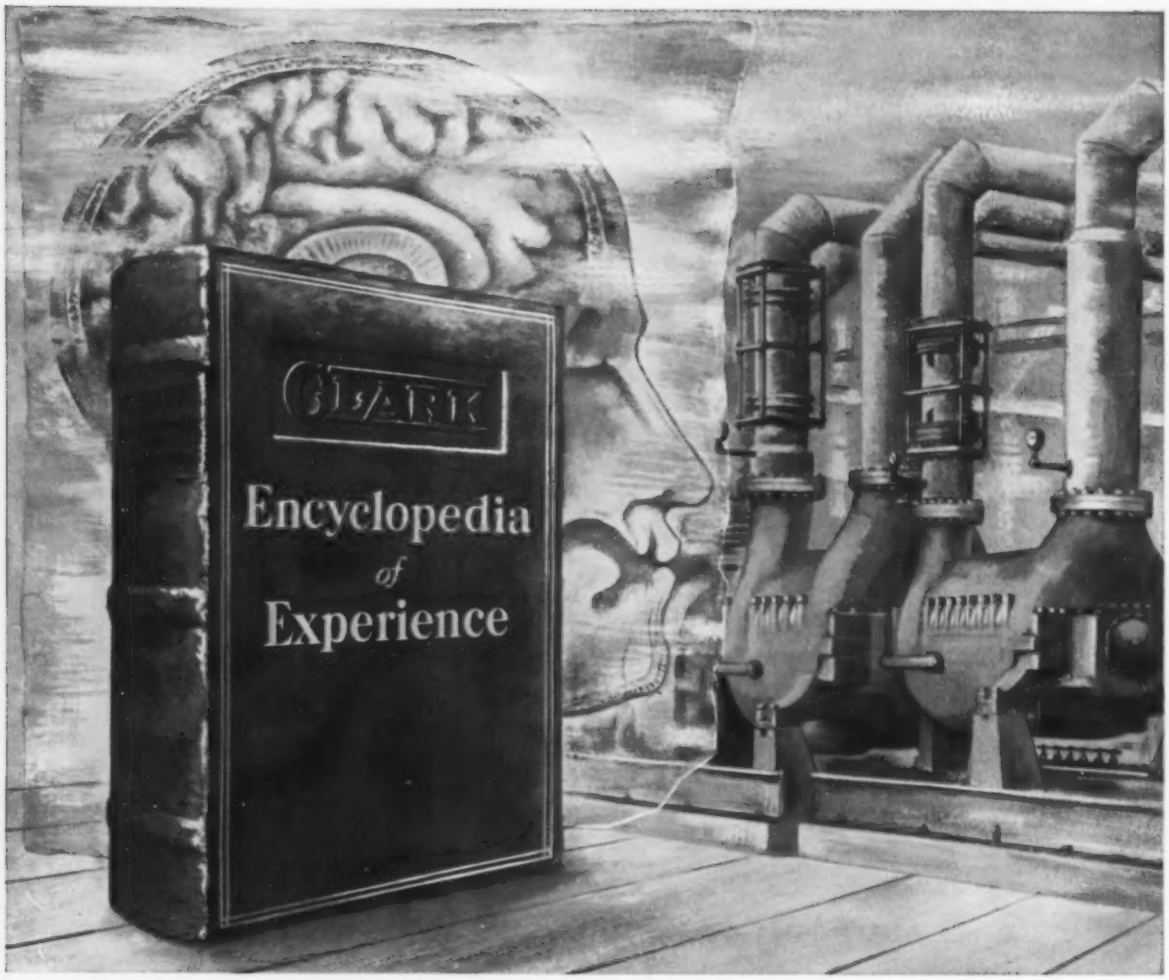
Check here for data on Virgo Electrolytic Salt and these other Hooker chemicals used for cleaning and treating metals:

- ☐ Virgo Electrolytic Salt
- ☐ Virgo Descaling Salt
- ☐ Virgo Molten Cleaner
- ☐ Caustic Soda
- ☐ Muriatic Acid
- ☐ NIALK® TRICHLORethylene

Clip and mail to us with your name, title and company address.

HOOKER CHEMICALS PLASTICS

HOOKER ELECTROCHEMICAL COMPANY
303 UNION STREET, NIAGARA FALLS, N. Y.
Niagara Falls Tacoma Montague, Mich. New York Chicago
Los Angeles Philadelphia Worcester, Mass.
In Canada: Hooker Chemicals Limited, North Vancouver, B. C.



Behind every Clark Compressor and Gas Turbine is an **ENCYCLOPEDIA OF EXPERIENCE**

The performance of a manufacturer's products over the years reflects the knowledge and skills of their builder. This compendium of engineering wisdom at Clark Bros. Co. can best be described as the Clark *encyclopedia of experience.*

The field performance of Clark's heavy duty compressors, and the engines and gas turbines which drive them, has earned for Clark the reputation of building "precision by the ton". Clark engineering, supported by the Clark *encyclopedia of experience,* is responsible for this performance and precision.

From Clark's vast experience, the needs of industry for ever better machines have been met. From it have come the many Clark contributions to the petroleum, chemical, and process industries.

It was the Clark *encyclopedia of experience* which was responsible for: the balanced/opposed principle for compressors... the world's first 2-cycle turbo-supercharged gas-engine-driven compressors and the oil seal that made centrifugal compressors practical.

These are but a few of the "firsts" and of the developments, plus the precision and performance, with which Clark engineering is credited. All stem from the Clark *encyclopedia of experience.*

If you use air or gas, you can get full information about Clark products to serve your industry by calling your nearby Clark engineer. Or write Clark Bros. Co., 2301 Lincoln Avenue, Olean, New York.

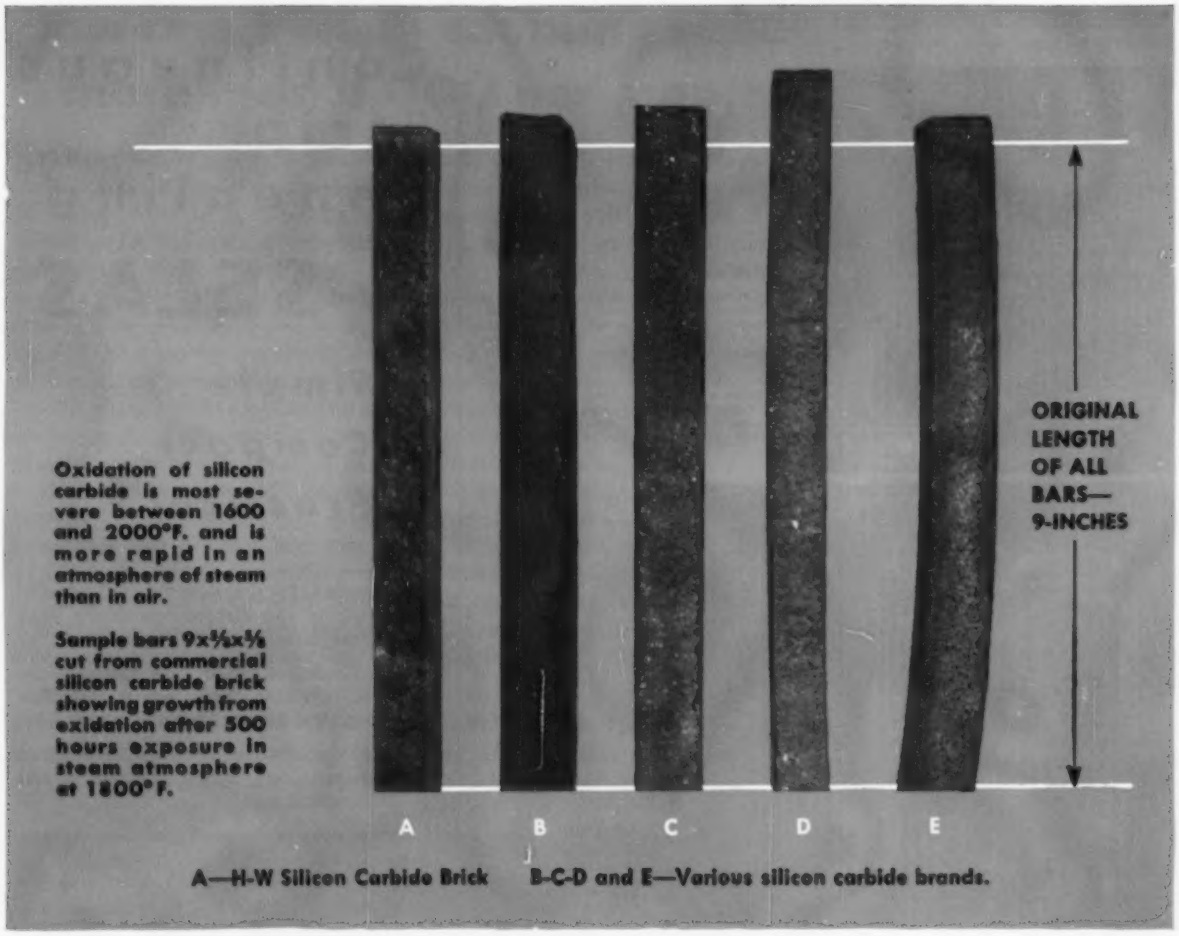
CLARK BROS. CO.

One of the Dresser Industries

Sales and service outlets in principal cities throughout the world

CLARK®

COMPRESSORS • GAS TURBINES


Oxidation of silicon carbide is most severe between 1600 and 2000°F. and is more rapid in an atmosphere of steam than in air.
Sample bars 9x½x⅝ cut from commercial silicon carbide brick showing growth from oxidation after 500 hours exposure in steam atmosphere at 1800°F.
ORIGINAL LENGTH OF ALL BARS— 9-INCHES
A
B
C
D
E
A—H-W Silicon Carbide Brick B-C-D and E—Various silicon carbide brands.

Announcing

Silicon Carbide Refractories

made by HARBISON-WALKER

Some of the physical properties of major importance are measurably enhanced by developments in manufacturing procedures. Many sizes and shapes are formed by impact under great pressure resulting in the most homogeneous texture with higher density and strength.

High temperature firing in a closely controlled atmosphere contributes to the formation of an exceedingly impervious surface and lower permeability. These properties improve resistance to the objectionable oxidation which always is accompanied by volume increase and loss in strength.

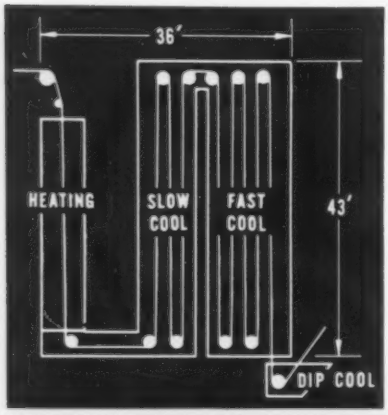
Physical properties possessed to the *maximum degree* by H-W Silicon Carbide refractories make them best suited for many applications. Briefly these properties are—Thermal Conductivity—Resistance to Mechanical Abrasion over a wide range of temperatures—Resistance to various fluxes—High temperature strength—Low Thermal Expansion and Low Spalling Tendency.

Write for recommendations and technical assistance.

World's Most Complete Refractories Service

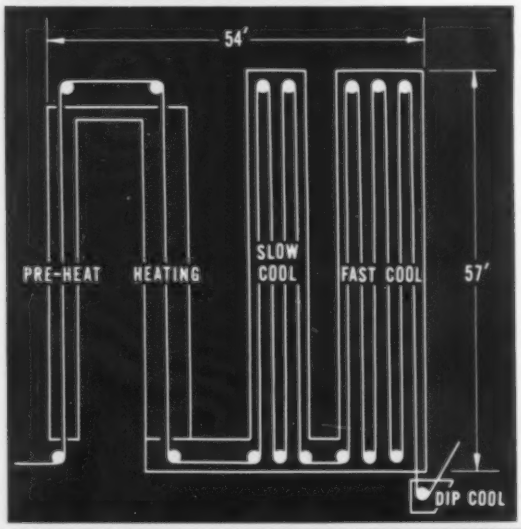
HARBISON-WALKER REFRACTORIES COMPANY
AND SUBSIDIARIES
General Offices: **Pittsburgh 22, Pennsylvania**

our research is your reward



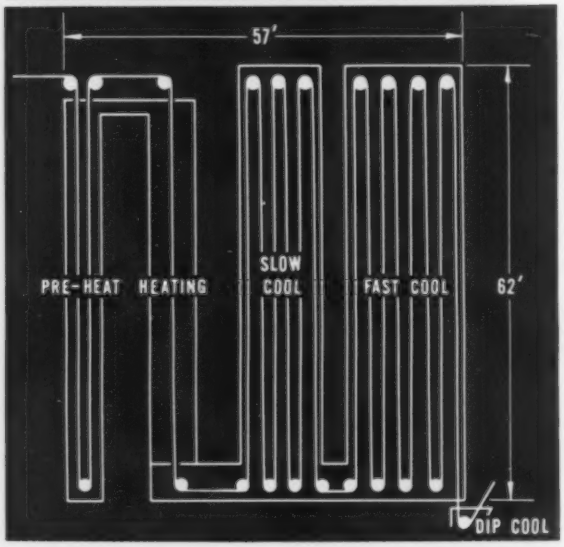
500 fpm

4 of these lines were installed across a standard mill building to provide an eastern steel producer with 400,000 tons per year increased capacity. The multiple installation enables this mill to meet simultaneously needs of several customers. Flow of material is across building because handling equipment, in relatively inexpensive lean-to-type structures, is installed at each end of line.



1,000 fpm

A midwestern steel producer preferred a single 1000-fpm line. Less than ⅓ longer than the 500-fpm line, the Selas line at left produces 200,000 tons per year of 44-in. strip.



1,500 fpm

Only 3 ft more length, 5 ft more height increases production 50%. Still compact, easy to install, simple to operate, economical to maintain. Even higher production rates can be attained with Selas direct-fired, single-pass strip annealing.

Continuous Strip Annealing by SELAS

...Simple
...Compact
...Practical

A glance at the diagrams shows the practical simplicity and compactness of the Selas single-pass, direct-fired heating principle.

The illustrations show how few rolls are involved, how little strip is in process. Notice that *no* rolls are in the heating sections.

Result: greatly-extended roll life, reduced maintenance costs, higher mechanical and electrical efficiency.

When strip stops, heating zone withdraws instantly, automatically . . . consequently accidental stoppages cause less down time and strip cannot be weakened by overheating.

Simplified construction means easier tracking, makes possible processing lighter gauges, wider strip.

The compactness of the entire line keeps installation costs down, saves valuable floor space, in most cases permits installation in standard 100-ft mill buildings.

Selas continuous strip annealing lines—single or multiple installations—are designed and constructed to meet your production requirements for prime strip, in feet per minute or tons per hour. If and when these requirements change because of market demands, your Selas lines, with versatility built into them, will help you meet new conditions quickly.

Our engineers will be glad to discuss how this Selas concept of Gradiation® annealing can be tailored to your strip processing needs. Address Dept. 13, Selas Corporation of America, Dresher, Pa.

Gradiation is a registered trade name of Selas Corporation of America.

SELAS
CORPORATION OF AMERICA
DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers

DEVELOPMENT • DESIGN • CONSTRUCTION

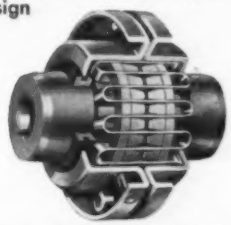
How one FALK coupling saved more than $1,000 per month

Pictured below is a Falk Steelflex Coupling assembly which connects a 2500 hp motor to a reduction unit driving an 18" bar mill in a Midwestern steel plant. This coupling replaced another type which broke repeatedly, causing maintenance expense averaging $1,000 a month—plus costly production losses. Since installation of the Falk Coupling, with its controlled torque mechanism that disengages when a predetermined overload occurs, there has been no interruption of production. Savings in maintenance and in lost production time are well in excess of $1,000 per month...dramatic proof of the importance of coupling design!

Long coupling life is not the sole criterion of coupling performance. Inadequate shaft couplings may be the cause of bearing damage or shaft breakage on your machines. If so, a change to Falk Steelflex will give two-fold protection to your connected machines: (1) compensation for reasonable degrees of shaft misalignment, and (2) torsional resiliency to reduce peak loads as much as 30%. These advantages are as important to you as the long service life of the Falk Steelflex Coupling itself.

Falk Steelflex Couplings, in types and sizes to meet virtually all industrial applications, are promptly available from distributor, warehouse and factory stocks. Consult your Falk Representative or Authorized Falk Distributor.

Basic **Type F**—cutaway view showing exclusive grid-groove design



THE FALK STEELFLEX ...a truly flexible coupling

Here is the coupling that has all the strength of steel, yet is truly flexible. *More than a million* have been bought for industrial service of many kinds.

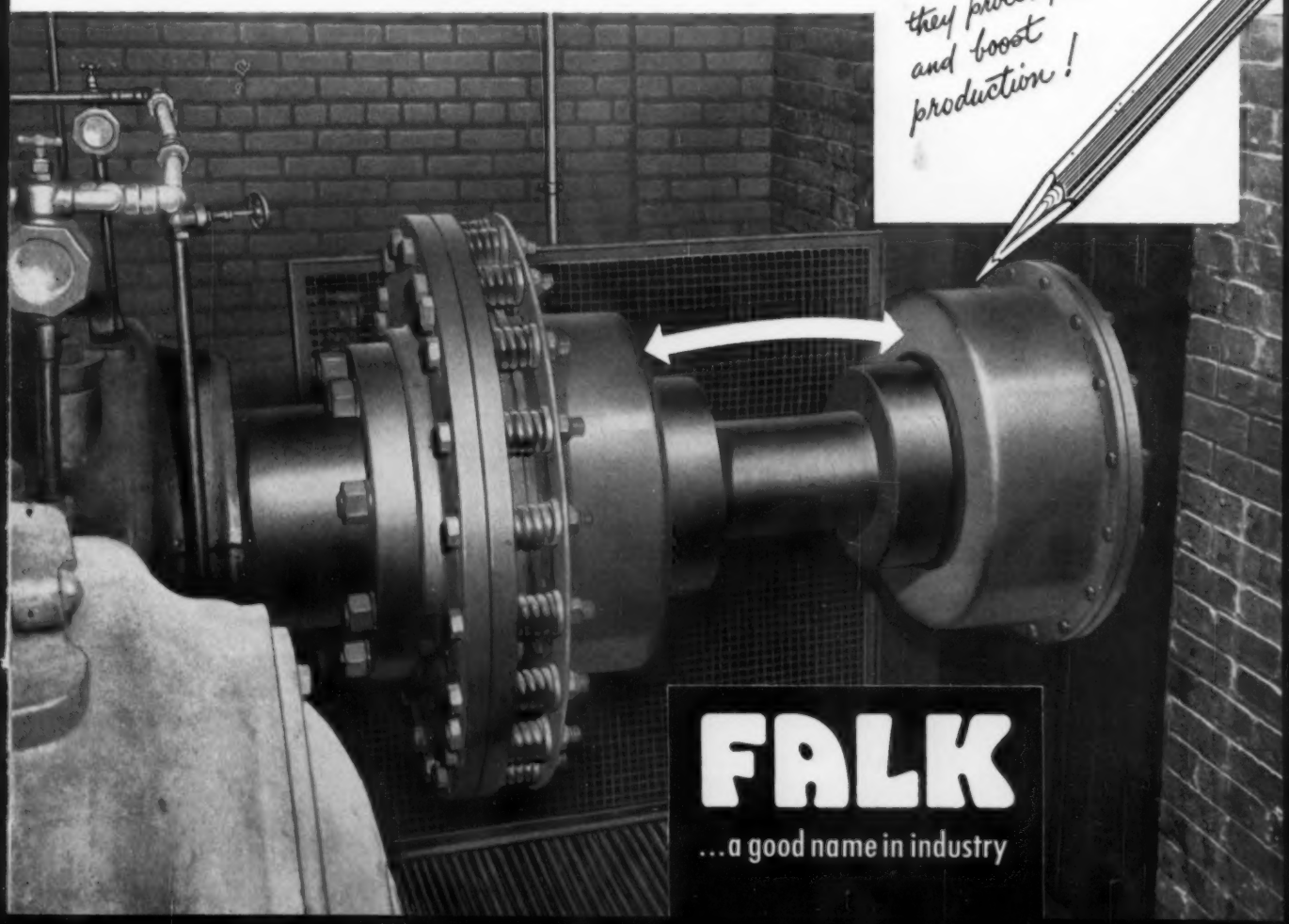
Because, in addition to its inherent superiorities of design, the Type F Steelflex can be used horizontally or vertically without modification or special parts, it has been adopted as standard in many plants—and by many designers and manufacturers of industrial equipment...Write for Bulletin 4100.

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

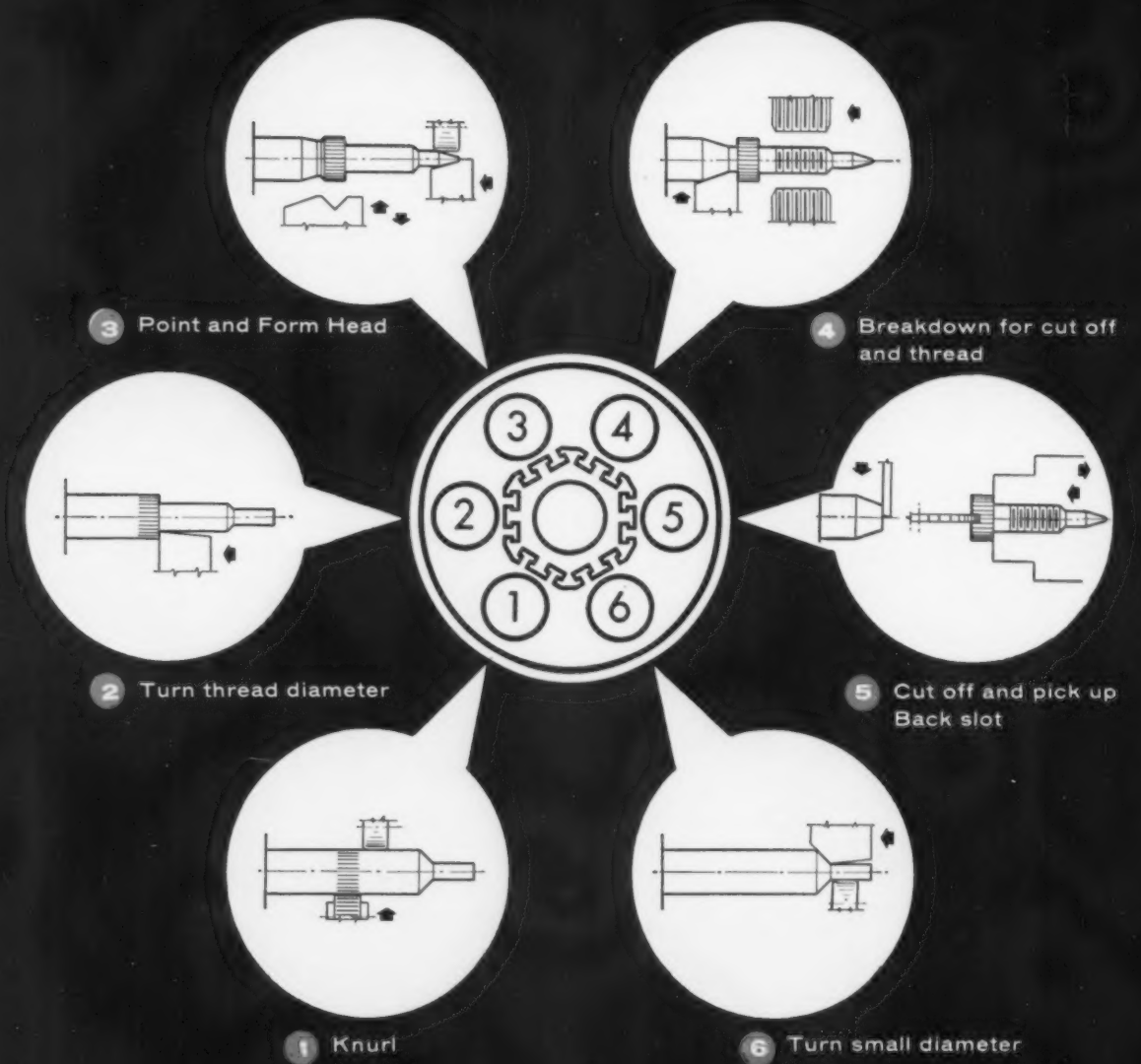
MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

Representatives and Distributors in many principal cities

Good couplings not only connect machines; they prolong machine life and boost production!



here's circumferential automation at work.....



In this example of circumferential automation, 9 operations are performed in 3 seconds to complete this carbureter idle adjustment screw. This part and thousands of others, many more complex, are produced to close tolerances, at high speeds and low costs on Acme-Gridley automatics.

circumferential automation*

pioneered by National Acme, saves floor space, reduces machine tool investment, lowers machining costs.

* Each spindle on an Acme-Gridley Automatic is an efficient work station where pre-sequenced operations are performed in succession without manual attention. This is automation . . . circumferential automation.

Circumferential Automation, inherent in all Acme-Gridleys since 1893, goes other forms of automation one step better. Instead of a line of machines, transfer devices and other space-consuming equipment, Acme-Gridley Multiple Spindle Automatics provide for maximum automatic production in a *single machine*. This means you save floor space, machine investment and man-hours.

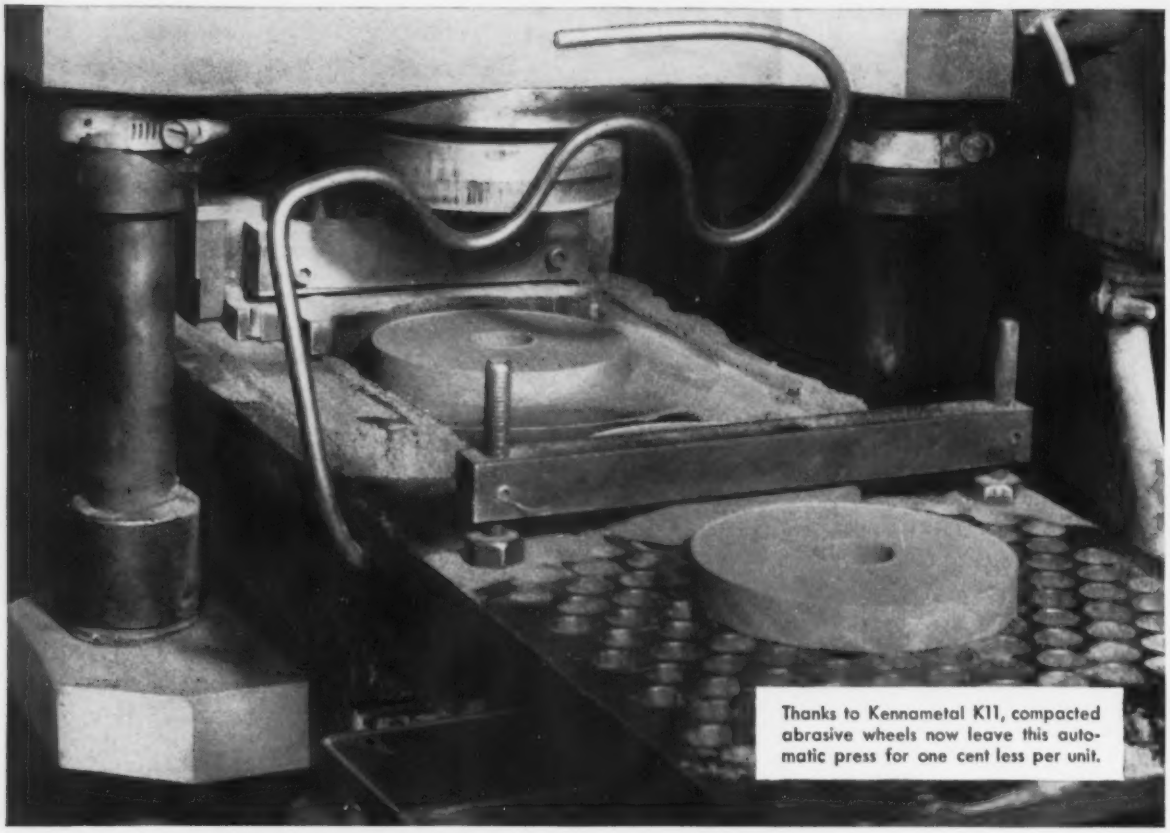
Acme-Gridley Automatics with their "wide open" tooling zone provide maximum machining flexibility. Their extra heavy, extra sturdy "box" construction assures day-in, day-out production with minimum human attention.

Let us show you how Circumferential Automation can go to work for you—speed your production, improve production quality *and* lower your unit cost. Our representative will be glad to call without obligation.

National Acme

THE NATIONAL ACME COMPANY, 175 E. 131ST ST., CLEVELAND 8, OHIO • Sales Offices: Newark 2, N. J., Chicago 6, Ill., Detroit 27, Mich.

All 'round the world where there's work to be done
and time to be saved there's an Acme-Gridley to do it.



Thanks to Kennametal K11, compacted abrasive wheels now leave this automatic press for one cent less per unit.

With KENNAMETAL'S* Grade K11...

a penny saved every time the die is opened

In an effort to reduce the unit cost of compacted abrasive wheels, The Carborundum Company searched for a die material that would better withstand the unusually severe wear to which the dies are subjected. Experiments with Kennametal Die Grade K11 indicated great savings could be made . . . and later production records have proved it. Dies now last twice as long as previous carbide dies . . . and five to ten times longer than those made from high-carbon, high-chrome steel. From an average cost of 1.4 cents for the high-carbon high-chrome steel dies, unit cost has now dropped to .4 cents using Kennametal Grade K11.

In addition to reducing your unit costs through extended die life and low maintenance, Kennametal Die Grades bring you additional benefits through their ability to hold close tolerances for greater product uniformity.

Get more information on the six grades of Kennametal's "90" series or the three exclusive, non-galling "80" series . . . a total of nine Die Grades developed to meet every die need, including yours.

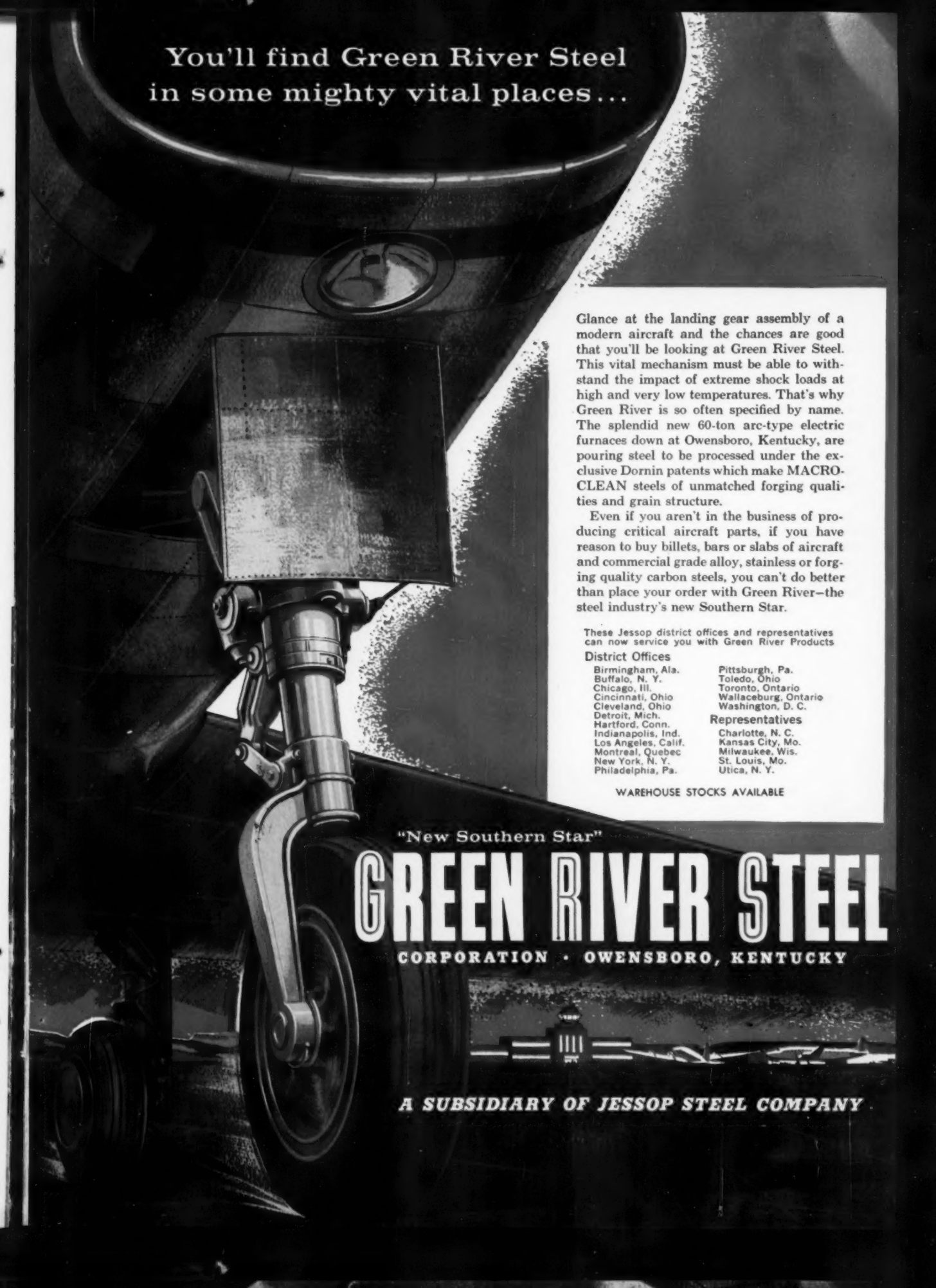
*Trademark

3103

Upper and lower halves of the die for compacting abrasive wheels from silicon carbide grit. Hard-working punch on the right and the mold or "liner" shown in center are now made from Kennametal.

Why not find out what Kennametal can do for the critical wear parts of your operation? Consult your die supplier, your Kennametal Die Engineer, or write: KENNAMETAL INC., Latrobe, Pennsylvania.

INDUSTRY AND KENNAMETAL ...Partners in Progress



Glance at the landing gear assembly of a modern aircraft and the chances are good that you'll be looking at Green River Steel. This vital mechanism must be able to withstand the impact of extreme shock loads at high and very low temperatures. That's why Green River is so often specified by name. The splendid new 60-ton arc-type electric furnaces down at Owensboro, Kentucky, are pouring steel to be processed under the exclusive Dornin patents which make MACRO-CLEAN steels of unmatched forging qualities and grain structure.

Even if you aren't in the business of producing critical aircraft parts, if you have reason to buy billets, bars or slabs of aircraft and commercial grade alloy, stainless or forging quality carbon steels, you can't do better than place your order with Green River—the steel industry's new Southern Star.

These Jessop district offices and representatives can now service you with Green River Products

District Offices

Birmingham, Ala.
Buffalo, N. Y.
Chicago, Ill.
Cincinnati, Ohio
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Detroit, Mich.
Hartford, Conn.
Indianapolis, Ind.
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"New Southern Star"

GREEN RIVER STEEL

CORPORATION · OWENSBORO, KENTUCKY

A SUBSIDIARY OF JESSOP STEEL COMPANY

BOSTON Gear adds *NEW* types and sizes to provide

SPROCKETS and CHAIN

in the full range required for drives from 1/4" to 2" Pitch

FROM STOCK!

NOW — you can meet any drive need — light to heavy duty — with standardized roller, block, or ladder chain and sprockets OFF-THE-SHELF from your BOSTON GEAR DISTRIBUTOR — AT FACTORY PRICES.

NEW **CATALOG SC-3**

lists all new types and sizes, and all other Sprockets and Chain in the big BOSTON Gear line. Includes helpful engineering data to simplify sprocket selection. For your copy, call your BOSTON Gear Distributor, or write Boston Gear Works, 72 Hayward St., Quincy 71, Massachusetts.

For nearest Distributor LOOK UNDER "GEARS" in the 'Yellow Pages'

CALL YOUR BOSTON Gear DISTRIBUTOR

7124 "OFF-THE-SHELF" TRANSMISSION PRODUCTS **FROM STOCK** — AT FACTORY PRICES — ASK FOR CATALOG

Stock Gears • Sprockets and Chain • Speed Reducers • Bearings • Pillow Blocks • Couplings

"We get higher recoveries with CHROMTEMP ferrochrome"

Closer chromium control and higher recoveries are obtained by adding CHROMTEMP exothermic ferrochrome to the ladle. Off grade heats are minimized, which means higher plant profits. In addition, this alloy does not preferentially oxidize aluminum added for grain size control. CHROMTEMP ferrochrome is available in three grades which add 5, 8 or 12 points of carbon respectively with each 1% of chromium added. For further information call your ELECTROMET representative.

ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

For maximum convenience, CHROMTEMP ferrochrome is packed in cans containing exactly 25 lbs. of chromium.

Electromet
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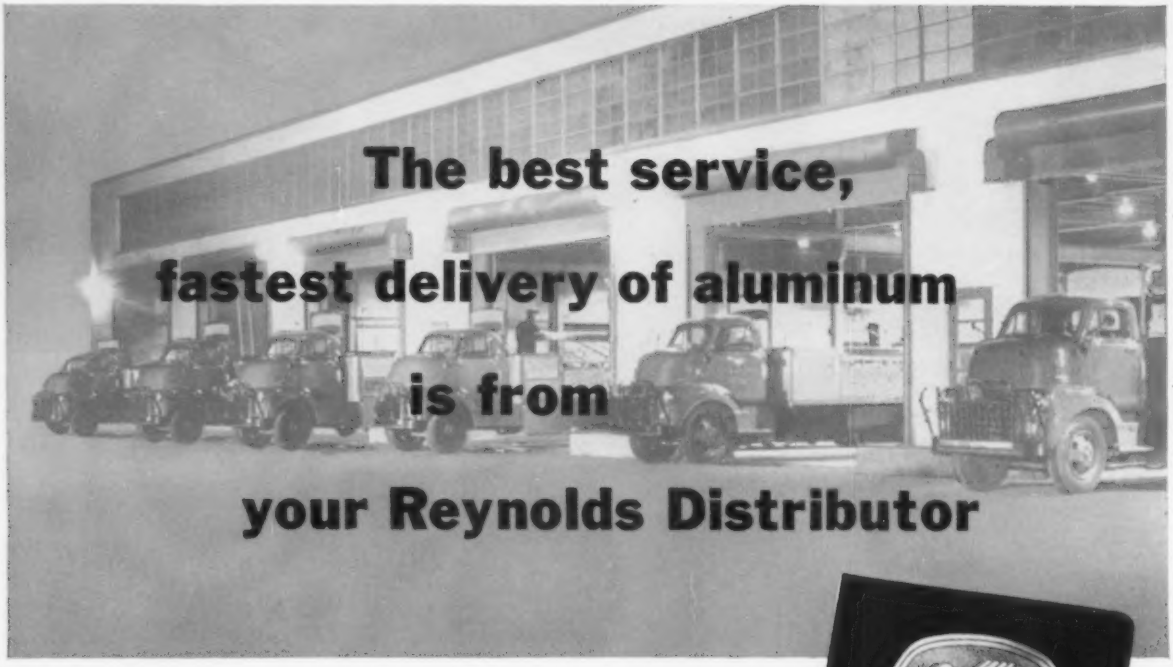

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This good-looking permanent binder gives you organized listings of every Reynolds standard warehouse aluminum product, and the sizes carried in our Distributor warehouses. A full list of Reynolds Distributors and branch offices —with phone numbers—is right there, too.

Send today for your free copy of this easy-to-use catalog on your business letterhead. Write to *Reynolds Metals Company, P.O. Box 1800-DH, Louisville 1, Kentucky.*

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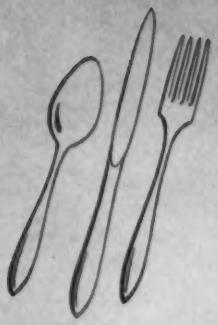
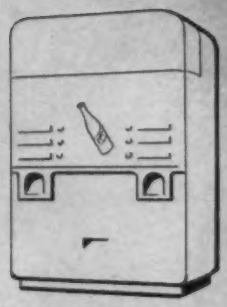
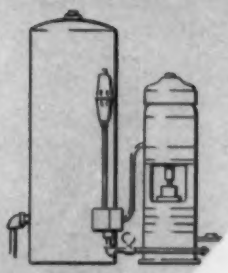


CUTLERY

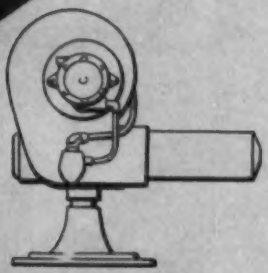


FITTINGS AND VALVES

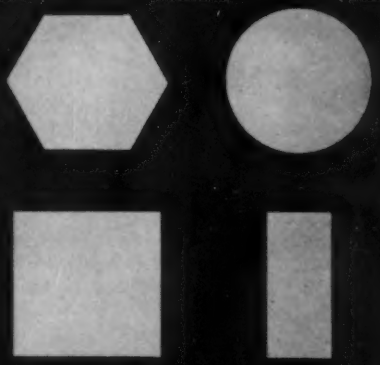


PUMP SHAFTS
AND VALVES

FASTENERS



BURNER NOZZLES



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for high production drilling and tapping

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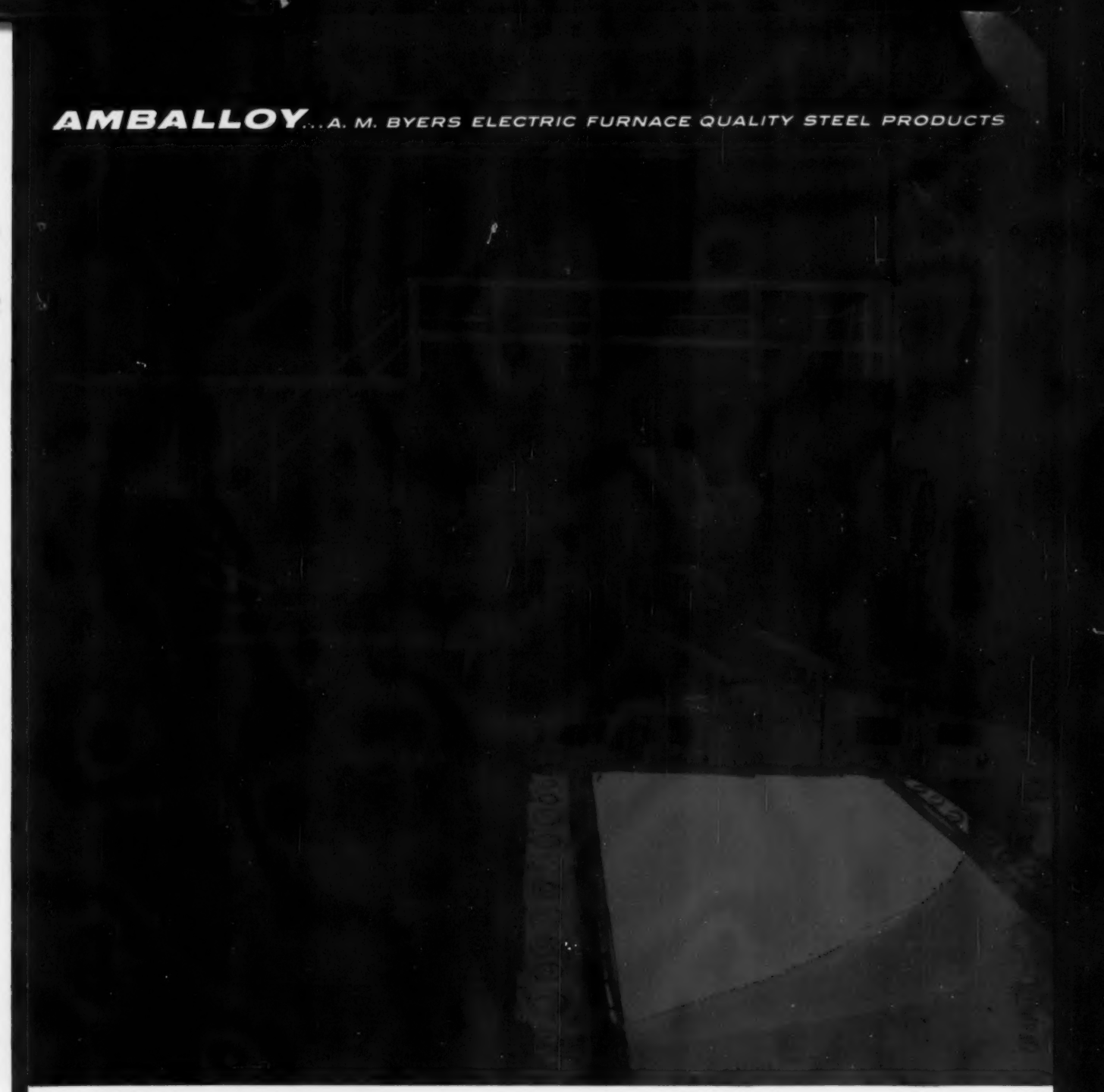

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No matter which *FINISH* you like—you can buy it in

MicroRold® QUALITY STAINLESS STEEL

2D—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets & strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.

2B—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.

No. 3—This surface is made by grinding with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.

No. 4—A finer finish than No. 3 made by grinding with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.

No. 7—Good reflectivity and brilliance made by polishing with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.

BRIGHT—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are available in types 201, 202, 301, 302, 304 and 430 except Bright which is type 430 exclusively.

These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.

Since Nos. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed.

For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Dept.

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Washington Steel *Corporation*

Producers of Stainless Sheet and Strip Exclusively

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75 TON WAGON CRANE

Built to the exacting standards of quality for which Industrial Brownhoist locomotive cranes are famous . . . the new rubber-tired 75 Ton Wagon Crane provides heavy-duty service in quarries, steel mills, shipyards, port and off highway construction jobs inaccessible to locomotive cranes. Patented Monitor-type cab and exclusive clear-vision boom provide the operator with 360 degree visibility for fast, efficient, safe operation. Write for new catalog 581.

206

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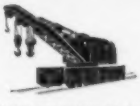
CLAMSHELL BUCKET



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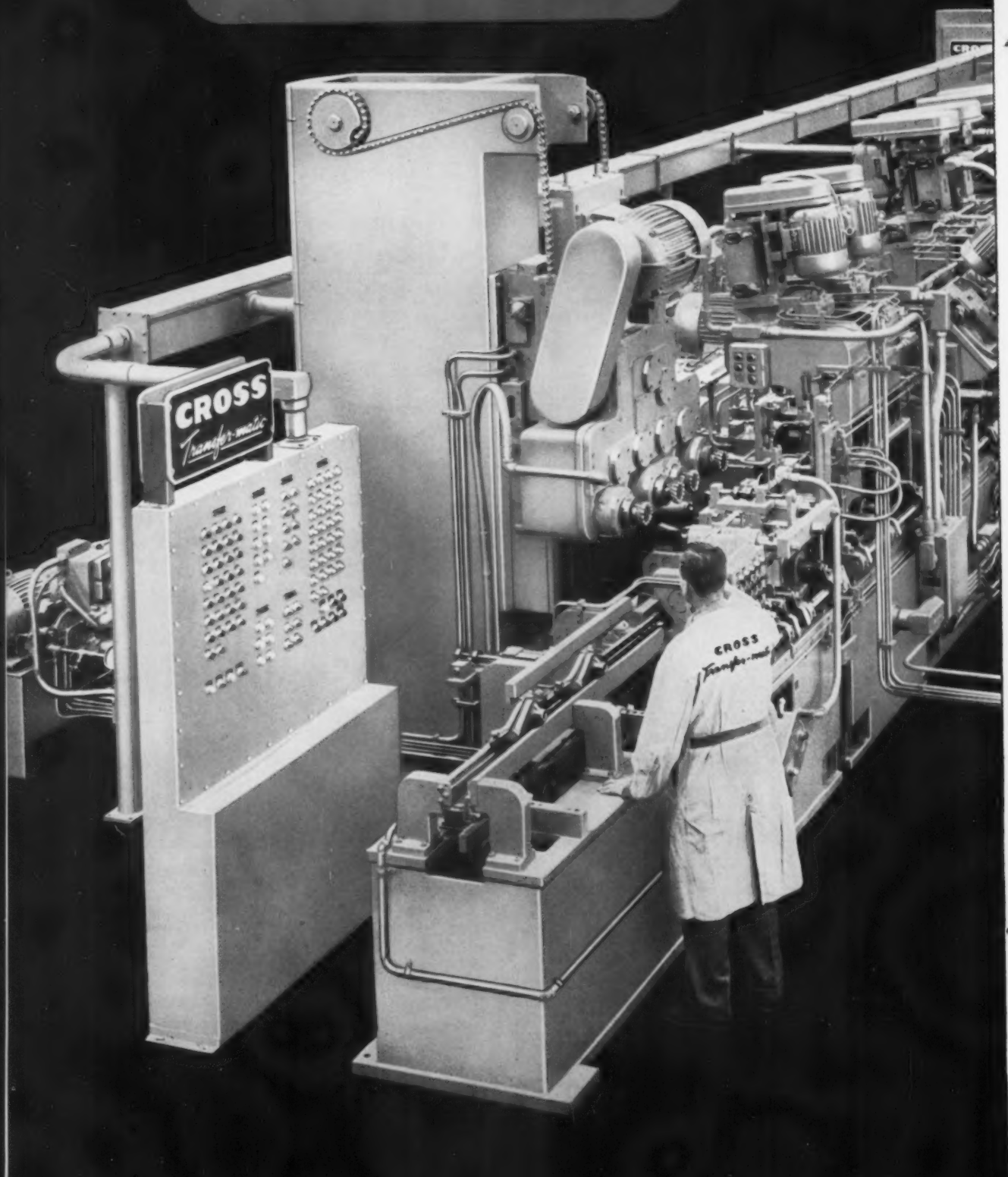
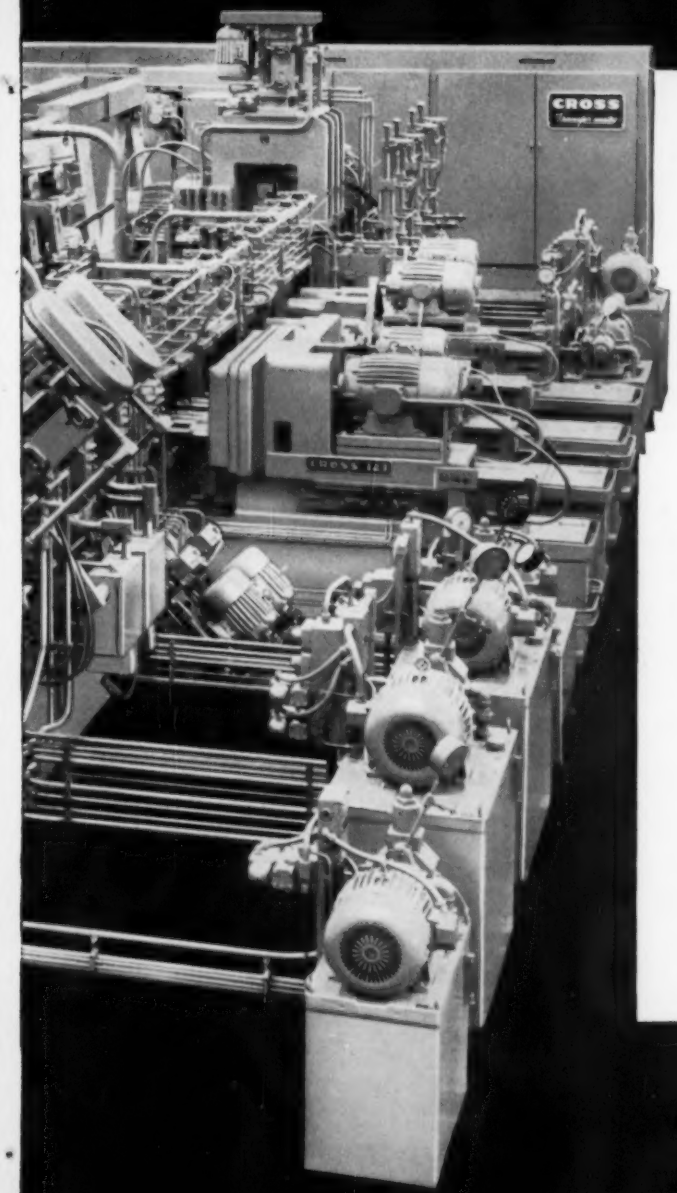
Complete Machining of Water Pump Bodies



Another Transfer-matic by Cross



★ **Machines two castings simultaneously at rated capacity of 200 pieces per hour.**

★ **Station 1 load; Station 2 mills mounting faces; Station 3 drills thermostat by-pass hole, mainshaft hole and four mounting holes; Station 4 cross-faces cover face and drills one angular vent hole; Station 5 chamfers thermostat by-pass hole, drills six cover holes, spot-faces mainshaft hole on inside; Station 6 cross-faces impeller face, reams thermostat by-pass hole and drills second angular vent hole; Station 7 spotfaces and chamfers mainshaft hole, spotfaces four mounting holes and drills by-pass hole on inside; Station 8 finish cross-faces impeller face and recesses center of mainshaft hole; Station 9 semi-finish bores mainshaft hole; Station 10 finish precision bores mainshaft hole; Station 11 tap drills heater connection hole and probes cover holes; Station 12 taps heater connection hole and six cover holes; Station 13 automatically unloads two pump bodies.**

★ **Locating: in Station 2, parts are located from foundry pads; in Station 3, from milled faces and cored water passages; and, from Station 4 on, from milled faces and two mounting holes.**

★ **Cross' "building block" principle provides flexibility for future part design changes.**

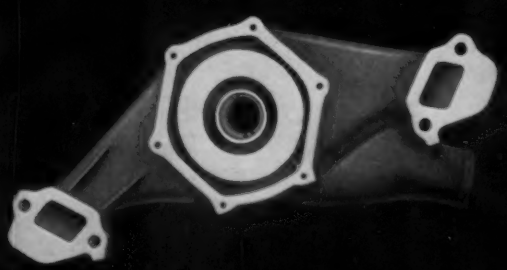
★ **Other features include: complete interchangeability of all standard and special parts for easy maintenance, construction to JIC Standards, hardened and ground ways and automatic lubrication.**

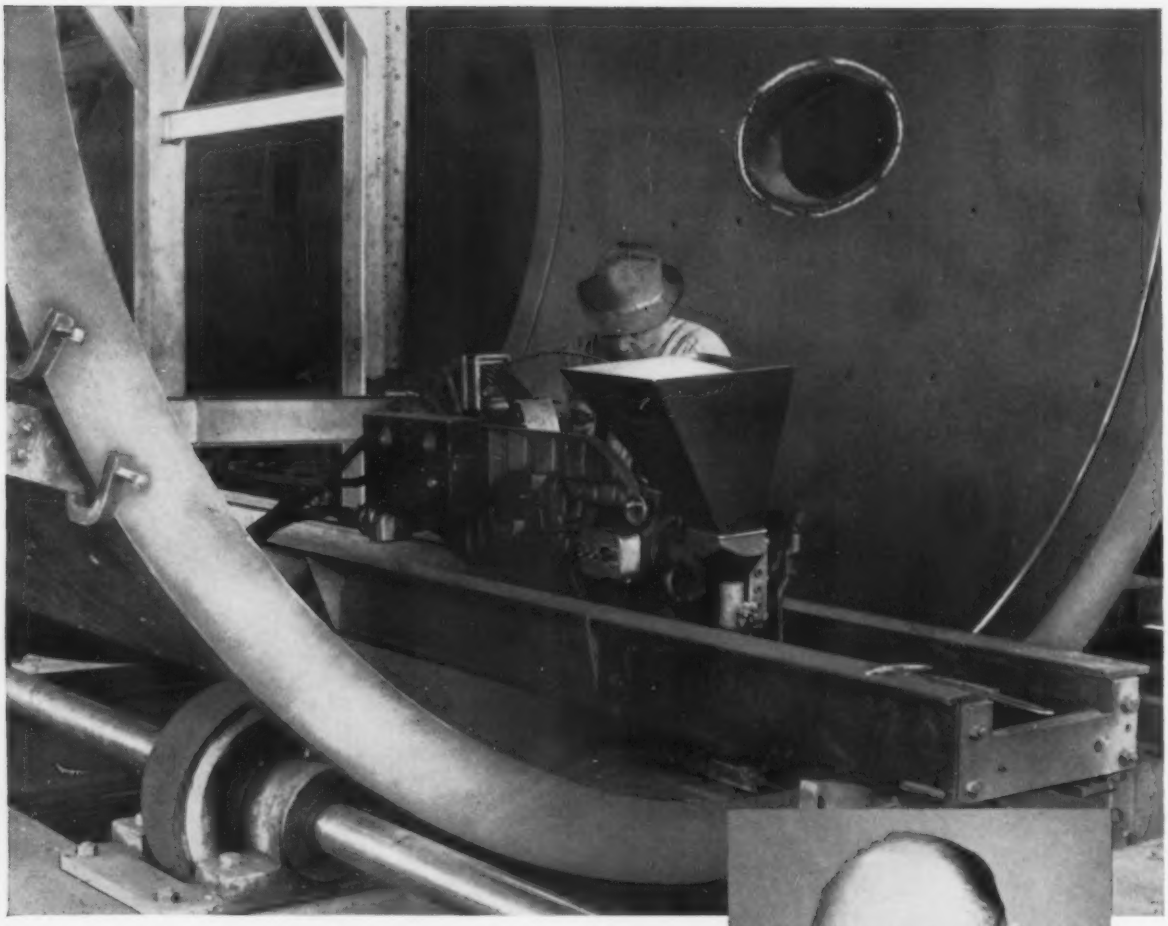
Established 1898

THE **CROSS** CO.

First in Automation

PARK GROVE STATION • DETROIT 5, MICHIGAN





Many of Mine and Smelter's Marcy grinding mills are equipped with Standard Steel flange rings, shown above. No flange ring replacements have ever been required. Some of these mills have been operating 24 hours a day for more than 15 years.

"'Dependability' is the keyword in our very fine relationship with Standard Steel"

We at Standard are happy indeed that Mine & Smelter Supply Co.'s chief engineer, J. R. Grout, appreciates the efforts we have gone to over the years to combine dependable service with our know-how and quality standards.

We consider it our responsibility to help maintain the world-wide reputation for quality mining and industrial equipment which Mine & Smelter Co.'s Marcy Mill Division enjoys by providing this customer with the same fine service it renders, in turn, to *its* customers.

Won't you discuss your needs for weldless rings, flanges, forgings and castings with us. You will appreciate our personalized service. Write Dept. 1-C.

"Standard Steel for many years has been supplying our company with shell flange rings, as well as riding and roller tires for use on our Marcy Grinding Mills and other rotary-type equipment. Their product quality and cooperation have helped make it possible for us to serve our customers promptly—our company policy. I believe the word 'dependability' is the keyword in our very fine relationship with Standard Steel," says Joseph R. Grout, chief engineer, Marcy Mill Division, Mine & Smelter Supply Co.

Standard Steel Works Division

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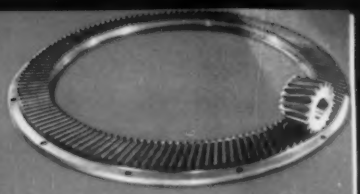
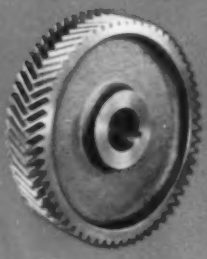
BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

BALDWIN BLH LIMA-HAMILTON

67 of the... 100





...largest U.S. industrial corporations* are customers of ILLINOIS GEAR

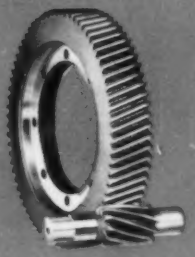
In some fields this percentage is even higher. Of the major metal producing companies* 77% are customers of ILLINOIS GEAR.

These are very remarkable percentages indeed . . . yet they reflect the preference for ILLINOIS GEARS by gear users, large and small, throughout industry.

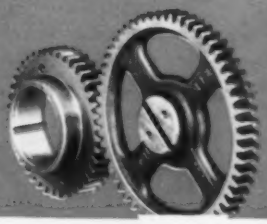
And there's good reason: gear users turn to ILLINOIS GEAR because they are placing an ever-increasing emphasis on quality in gears . . . a quality that they demand and get in every order.

No matter what the industry . . . machine tools, steel mills, cement mills, paper mills, chemical plants, construction equipment . . . this recognition for quality in gears has been rightfully earned because it characterizes every step in the manufacture of ILLINOIS GEARS.

If you want gears that are made right, with quality as the first consideration, specify and buy ILLINOIS GEARS...they will more than satisfy your most exacting requirements.



*From The Fortune Directory of the 500 Largest U.S. Industrial Corporations, July 1957.



Look for this mark (ILG)® the symbol on finer gears

ILLINOIS GEARS Reg U.S. Pat. Off.

Gears for Every Purpose ... one gear or 10,000 or more

ILLINOIS GEAR & MACHINE COMPANY

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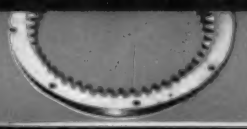


ND FACTS

Position means nothing in the life of a ball bearing!

Upside down . . . right side up . . . sideways! Electric motors made with New Departure ball bearings keep their performance promises in *any* position.

Such versatility is welcomed by appliance makers . . . machine tool builders, too . . . because it means infinite freedom of design. Accessibility for service need not be the ruling factor in motor location. For motors made with New Departure ball bearings . . . like the bearings themselves . . . are built to be forgotten for long periods of service without need for relubrication. Best of all, you'll find there's no adjustment necessary because of wear.

If you're looking for ways to simplify product design while you improve product performance, write or call for details on New Departure ball bearings. New Departure Div., General Motors Corp., Bristol, Conn.

1908–1958 GM FORWARD FROM FIFTY

ND NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

NOTHING ROLLS LIKE A BALL

Warehouses Running Low

First it was the steel users, but now even the warehouses are starting to run out of particular items. So far, the things involved are chiefly alloy steels, special shapes, some carbon bar sizes, and some of the less common gages of sheet and strip. Because the quantities are small, the trend hasn't produced any great change in warehouse buying habits. But it is a straw in the wind.

Better Plaster-Mold Cores

A new technique in plaster mold casting uses cores which are prepared in separate sections and bolted together with hidden studs and nuts. Sectioned cores are said to offer more precise control of internal dimensions in plaster-cast parts. The technique has been applied successfully to aluminum waveguide units and other electronic devices.

New Brazing Technique

A method of wide-gap brazing for better joints in high temperature applications will be announced soon. Research and test programs covering several years have proved it to be practical. Potential fields of use include missile and nuclear equipment manufacturing.

Who'll Read Russian?

Congress may block plans for a full-scale program of translating Russian scientific journals. The Atomic Energy Commission and the Central Intelligence Agency now do a limited amount of this work. A Commerce Dept. bid to get a broader project under way has been stymied by lawmakers who want to be sure it won't duplicate other efforts.

Automation Backfires

Automated controls "glamorize" a job and create some real problems, industrial engineers say. Men who did routine maintenance on electrical parts push for higher ratings when they start handling electronic components — even though the new function consists simply of replacing one plug-in unit with another.

Textured-Steel Uses Grow

Textured steels are winning a significant place for themselves. One New York office building is being built entirely of textured stainless panels, and a leading soft drink maker's cooler cabinets will soon be made of textured and colored steel. Automobile builders are finding uses for the material, too.

Predict New Cermet Forms

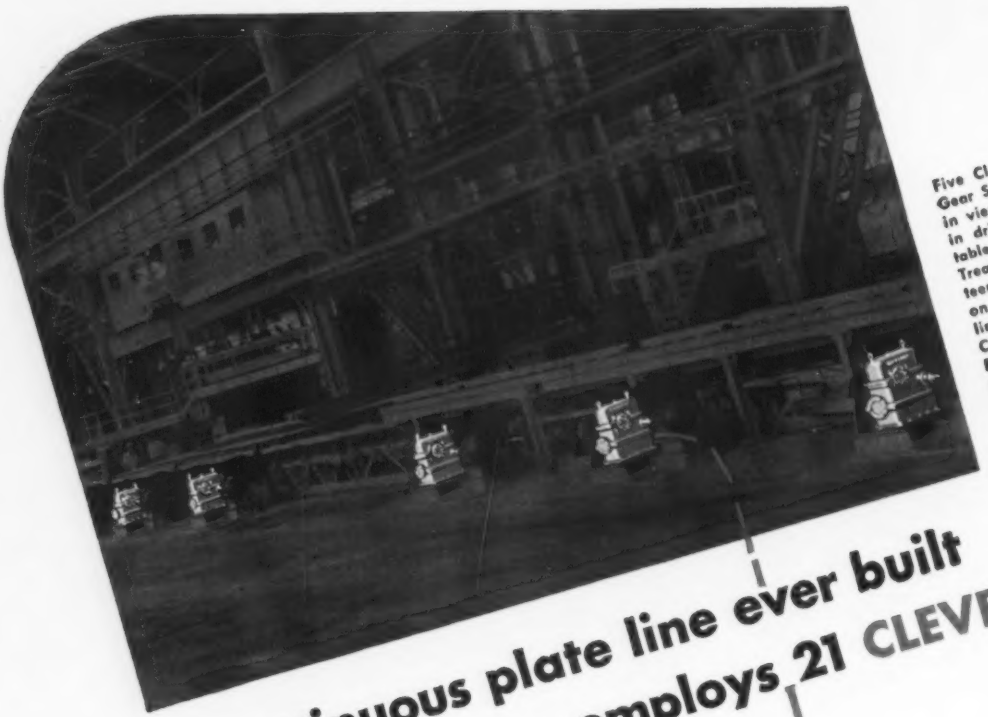
The drive for better hot-strength materials will produce many new combinations of metals and ceramics, a leading metallurgist predicts. He expects industry will learn to use these more brittle materials, "just as we've learned to use glass." All metal structures will still be needed, however, and a bright future is seen for molybdenum-, tungsten-, tantalum-, columbium, and iron-aluminum-base alloys in honeycomb and sandwich-type structures.

Buy Research Overseas

Several metalworking companies are farming out research work to laboratories abroad. The price is right and there are plenty of good facilities available and eager to get the business, it's said. Those who have already shipped some of this work overseas believe that the number of U. S. firms doing the same thing is growing every month.

Cold Forming Pays Off

Cold forming techniques bring one auto maker spectacular savings in materials, capital equipment, and overall processing costs. One example: by cold extruding its piston pins, the firm saves 2000 tons of steel per year.



Five Cleveland Worm Gear Speed Reducers, in view, are engaged in driving the layout table for these Heat Treating furnaces. Sixteen others are in use on other parts of this line, built by the Drever Company, Bethayres, Pa., and installed in the plant of Lukens Steel Co., Coatesville, Pa.

Largest continuous plate line ever built employs 21 CLEVELANDS

THE drives will never be a problem on this, the largest continuous heavy plate line ever built. Twenty-one Cleveland Worm Gear Speed Reducers assure smooth, uninterrupted transmission of power from motors to table mechanism in this Heat Treating furnace line.

Cleveland worm gear speed reducers are ideally suited for an installation of this magnitude. Space is saved by the compact Cleveland design. Installation is easy and maintenance is negligible. You'll find Clevelands throughout the steel industry, in every phase of operation. And, in case after case, Cleveland speed reducers have proved to be so dependable and long-wearing that they outlast the machines they drive.

Get full engineering data on the Cleveland line. Catalog 400 is free—write today. The Cleveland Worm & Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

New Look in Nickel: Producers Shift to the Hard Sell

Capacity Growth Forces Quest for New Markets

After years of fighting off prospects, nickel salesmen are out making calls.

The reason: Output has finally passed demand.

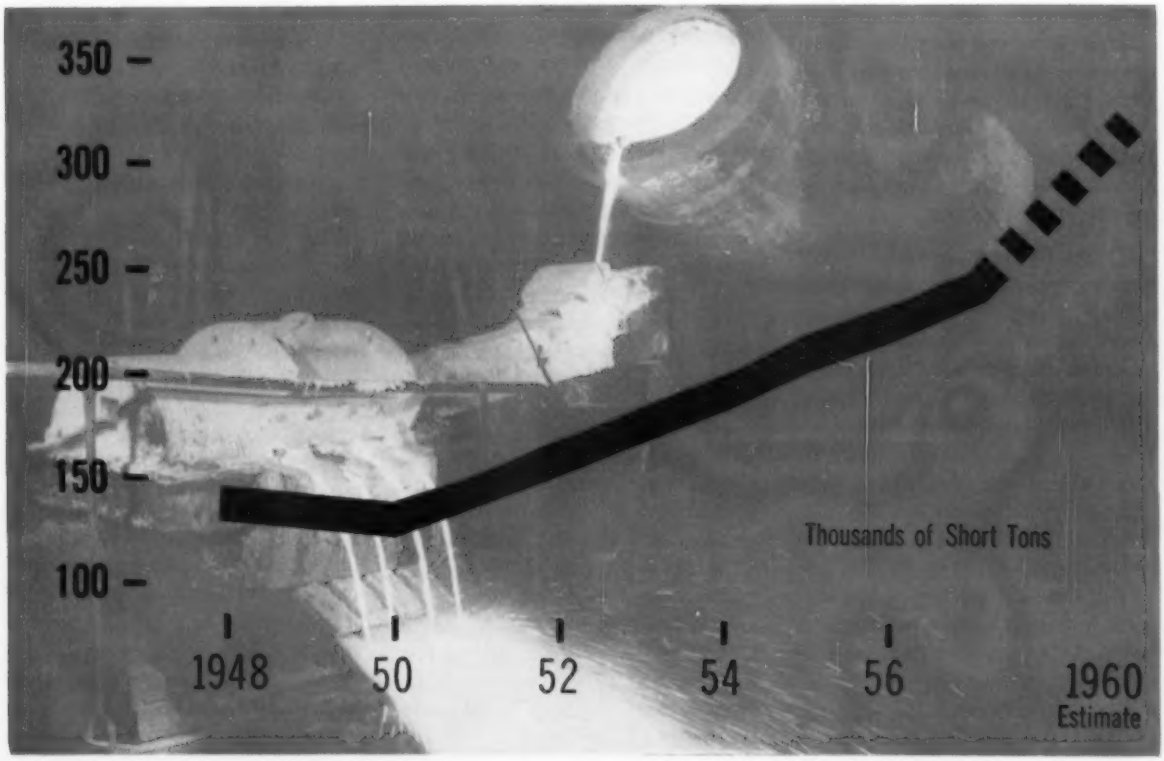
Big problem is winning back former customers that switched to competitive metals during lean years.—By G. G. Carr.

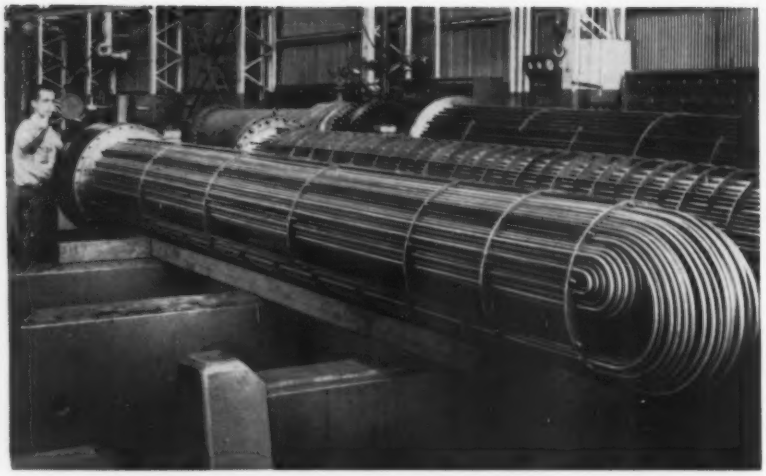
▪ Nickel producers are once again out ringing doorbells. After years of having to apologize to prospective buyers, they now have metal to sell. And they find the change exciting.

Last year's performance shows the future. At the start of 1957, civilian nickel demand was well over supply, after stockpile and defense needs. But by the year's end, customers' inventories had grown by 25 million lb. And the government had a large supply of nickel diverted from the stockpile available to civilian buyers.

More Metal—Supply will continue to grow. International Nickel Co. estimates by 1961 free world nickel capacity will be 650 to 675 million lb annually. This prospective bulge in capacity over demand

Boom in Free World Nickel Output





NICKEL AT WORK: These partially completed Monel and Cupro-nickel tube bundles for feedwater heaters are one of the many applications in which nickel plays an important role.

means development of new markets is again possible and "downright essential."

It won't be all new business by a long shot. During the shortage, good nickel customers were driven to substitutes. Many, probably most, are anxious to return to nickel, say producers. But some must be re-educated. A few are probably permanently lost.

Nickel's problem is complicated because ultimate consumers are often one or more steps removed from its direct customers. The steel industry, for example, is glad to provide nickel alloy steels. But it's generally up to the customer to specify these grades.

Triple Barrel Approach—Albert Gagnebin, Inco's assistant vice president in charge of nickel sales, believes the industry's sales campaign must be three-pronged: (1) Existing markets must be extended, and lost ground recaptured where possible. (2) New markets must be found and developed. (3) Most challenging, new nickel-bearing materials to meet new needs must be developed.

The industry believes it has suffered little real harm from the lean years. Relatively few alternate materials have proved fully satisfactory at competitive prices, producers say. Markets permanently lost or shrunk are due to changing technology rather than alternate materials. Detroit is a good example.

Structural Use Off — Structural use of nickel in passenger cars has declined markedly over the past 20 years. The reason: Years ago, bad roads and relatively crude design meant far greater in-service stresses and shocks to autos. Conversely, nickel-steel use in trucks and off-the-road equipment continues up as producers turn out more rugged equipment. Inco is developing economical nickel-steels for the intermediate stress range in passenger cars.

Steel remains nickel's No. 1 customer, present and potential. Nickel is a prime factor in both alloy and many stainless grades. Metallurgists have done yeomen's service in developing nickel-lean grades for periods of shortage. But nickel-rich grades remain the old faithfuls.

Closest Competition — Constructional steels present the greatest sales challenge. Competitive grades perform well in many applications. Often there is little difference between these and the nickel grades. Generally speaking, it's all one to most mills, which have no interest in promoting either over the other. Here nickel companies must carry the battle to the buyer.

Machinery operating loads and speeds continue to rise. Other operating conditions are often more rugged. "It's hard to beat nickel under those circumstances," says William Spahr, Inco manager of steel industry sales.

For Low Temperatures — New products are important in the alloy steel field. The 9 pct Ni-steel is catching on fast for cylinders and pressure vessels designed to operate near the bottom of the thermometer. And absence of distortion is promoting its use for such as large, complex gears which can be carburized, then cooled in the furnace to obtain case hardness of 60 Rockwell C.

For low temperature applications, this grade was developed to be competitive with aluminum and copper-base alloys, not nickel-lean stainless. Also in the low temperature field, availability of 2.5 to 3.5 pct Ni-steels is winning back users from substitutes.

Potential—There is still lots of room for improvement. Oil well drillers say they use 4800 for drill bits only because they can't find anything better. Inco laboratories are hard at work looking. Potential is considered enormous. "There's no reason why we can't have steels of 500,000 lb tensile strength in 5 or 10 years," predicts Mr. Gagnebin.

Not completely neutral, steel mills are valuable allies in boosting nickel-rich stainless sales. The mills are aggressively pushing, and find nickel-rich grades are the most wanted. Until recently, producers have had to soft pedal some bright nickel-rich stainless markets simply because the nickel was not available. (The IRON AGE, Feb. 13, 1958, p. 82.)

Battle the Light Metal—Inco is unhappily aware of competition to nickel-rich stainless from aluminum, particularly in construction and transportation fields. But, it believes time and metallurgy are on its side. A big gun is new techniques for using thin sheets kept flat by backing materials. For many applica-

tions it is hoped this will give stainless the cost advantage. As for the lower nickel, 200 stainless series, "It's much too early to tell how they'll work out in a competitive market," says Inco.

The prime and traditional market, plating, should expand rapidly. Here, the nickel shortage hurt. Platers and their customers were forced to other methods, and were especially vulnerable to black market operators. But these wounds are healing quickly, and plating should be a growing market for some time to come.

Plating Aims — Inco stresses nickel plating is still the cheapest method of metal finishing for both decorative and functional uses. Nickel can now be deposited bright. Inco hopes this will be a major factor in helping platers regain much of the lush automotive brightwork market.

Various nickel cast irons also show good potential. Manufacturers appear to be increasingly anxious to incorporate the abrasion and corrosion resistance of such as Ni-Hard and Ni-Resist into their products. Inco has particularly high hopes for ductile Ni-Resist.

Government materials control forced nickel out of much of the once-promising gray iron market. But the growth of the ductile iron market should more than compensate for this, Inco believes.

Cupro-Nickel Outlook—New developments, including availability, should boost sales of the cupro-nickel alloys. Greater use of corrosive material in industry is a trend that should help, for uses from condenser tubes to water heaters. Quiet, but intensive, work on units for conversion of salt to fresh water is expected to open up a tasty market in the near future.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th St., Philadelphia 39, Pa.

Who Is Landing Big Defense Contracts?

▪ Companies who have a buffer of a defense contract or two to fill the holes in production schedules are in a fortunate position today. Mostly, they are aircraft and electronics firms.

These two industries dominate the U. S. Defense Dept. list of 100 largest military prime contractors. The 10 biggest suppliers are exclusively electronics or aircraft (see table, below) as are 17 out of the first 20.

Almost all of the 100 companies on the list, which covers the period from January, 1955, to June, 1957, are doing work on aircraft, missiles, and ships or for related equipment and supplies, the Defense Dept. says.

Changing Pattern — Net awards to these 100 companies and 174 affiliated firms amounted to 63.7 pct of total defense spending. Translated into dollars, the total was $44.8 billion during the 2½-year period.

The changing pattern of defense spending is pointed up by the ranking of the Big Three automotive companies. In the seven years from 1950 to 1957 General Motors Corp. was the No. 1 government contractor. Ford Motor Co. was No. 12 and Chrysler Corp. No. 13.

But since 1955, General Motors has dropped to No. 15 and Chrysler slid back to No. 45. Ford managed to hold on to its No. 12 spot.

Many New Firms—The Defense Dept. points out that its major prime contractors do not constitute a fixed group of companies.

As an example, one fourth of the companies who were among the 100 largest suppliers during the Korean conflict have been displaced by other companies since 1955.

Subcontractors Share—The Defense Dept. also points out that 70 of its largest contractors subcontracted 56 pct of their military orders to other companies during 1957, paying out more than a third of this amount to small business.

"Through subcontracting, thousands of large and small companies which do not have the resources to undertake a large military prime contract are able to make substantial contributions to the defense effort," the Defense Dept. says.

Ten Largest Military Prime Contractors

	Millions of Dollars
General Dynamics Corp.	$2,358
United Aircraft Corp.	1,979
General Electric Co.	1,928
Boeing Airplane Co.	1,923
North American Aviation, Inc.	1,840
American Telephone & Telegraph Co.	1,339
Lockheed Aircraft Corp.	1,193
Hughes Aircraft Co.	867
Douglas Aircraft Co., Inc.	842
McDonnell Aircraft Corp.	816

Uncertainty Grips Auto Industry

Cutbacks Fail to Check Rising Inventories

Low sales levels are compelling automakers to curtail production sharply.

Resulting unemployment is becoming a major problem in industry centers.—By H. R. Neal.

▪ The automobile industry is rapidly skidding into one of its worst years in recent times and isn't sure how to make the brakes work. They aren't even sure what started the skid in the first place, but they suspect a nation-wide drop in "confidence".

As signs of a downturn became noticeable near the end of 1957, some automakers warned business against a panic. Hasty cutbacks, they said, would only serve to shake the nation's confidence even more. One point made was personal savings are at an all-time high of $20 billion. The job is not one of retrenchment but of building confidence and digging the dollars out of the buyers' bankbooks.

But Cutbacks Continue—Despite pleas for greater confidence, some faint heart has been shown by the automakers. Ford's output for the first two months of the year is a third less than a year ago. According to reliable reports, Ford has made a 25 pct across-the-board slash in engineering department personnel. Other departments have suffered similar reductions.

Chrysler's production is only 40 pct of a year ago. The company has thinned its ranks in much the same manner as Ford in a series of "bloody Fridays." A grim joke among those remaining is: "Don't answer the phone. It might be your boss."

Only AMC Gains—As yet, General Motors' production trails 1957 by only about 20 pct. Even so, only Chevrolet and Cadillac are close to 1957 totals, and Chevy has been losing some steam.

Studebaker-Packard is 50 pct behind last year, and has worked only 3-4 wks. since the beginning of the year. Only American Motors has shown strength with output more than double the first two months of 1957.

Dealer Inventories Climb — Successive production cuts since the first of the year have slashed total industry output drastically. February output was around 390,000 passenger cars, for the worst February since steel-short 1952. In February, 1957, some 570,000 cars rolled off assembly lines.

Despite the sharp cutbacks, field stocks of new cars have continued to grow. Latest estimates place inventories in excess of 850,000 units and rapidly approaching the record high of 905,000 reached in March, 1956. February's daily sales rate was about 13,000—less than enough for a 5 million car year. Car stocks are enough to last 70 days at the February selling rate.

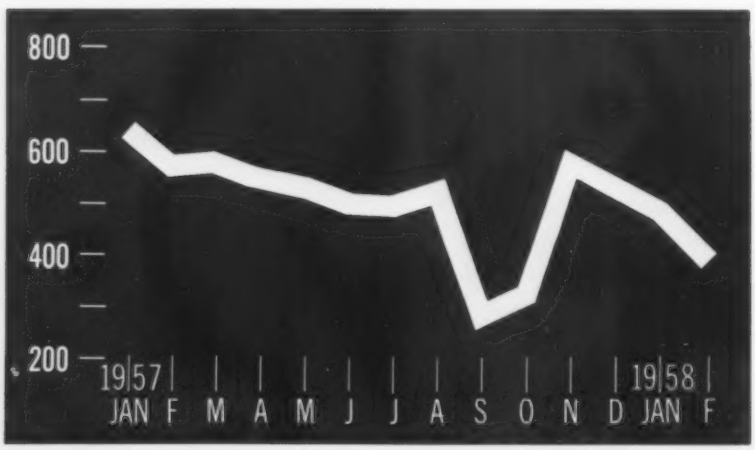
Employment Slashed — To hold down field stocks of new cars, the automakers have turned to short three or four day work-weeks and one-week shutdowns. However, the move hasn't proved entirely successful.

Unemployment has risen in the auto industry at an alarming rate, particularly in Detroit and the rest of Michigan. Other metalworking centers dependent on automobile business have also felt the backlash as auto companies slowed down.

Jobless Tally — Some 350,000 workers, or 12 pct of the labor force, were idle in Michigan at the end of February. Of these, 205,000 are located in Detroit—13.5 pct of the city's labor force. At the end of 1957 the number of unemployed was 231,000, 7.9 pct, in the state, of which 135,000, or 8.8 pct of the labor force, were in Detroit. In January, 1957, the figures were 162,000, or 5.5 pct, for the state as a whole, and 91,000, or 5.9 pct, in Detroit.

The Michigan Employment Se-

Auto Output: Not Enough Buyers



Thousands of Cars

curity Commission, which compiles the figures, reports only 225,000 of the 350,000 unemployed are currently drawing compensation. The others either aren't eligible or have exhausted their benefits. It also said some 9-10,000 persons are exhausting their benefits each month.

State May Step In—Michigan's Legislature is studying a proposal to extend benefits to those whose have run out. The plan would entitle a person to one additional week's coverage for each three weeks of eligibility at a rate of 75 pct of the regular payment. Now the average payments are for $35-36 a week for 13 weeks. The state's max. rate is $55 a week for 26 wks. A big boost has been provided by SUB which brings income for many up to about $50 a wk.

Not counted in the jobless category are those working short weeks and whose income is equal only to unemployment benefits. At Chrysler Corp.'s Dodge plant many have been working as few as 11-15 hrs, due to a continuing dispute over production standards.

Union Is Determined — The UAW has demanded the auto companies drop the short work-week schedules and lay off as many additional workers as necessary to maintain a 40 hr week for those remaining on the job. In this way, the union said, at least some workers would have a full paycheck. The others would collect just as much from unemployment benefits and UB as they do working three days.

Another cloud over the auto outlook is the impending labor negotiations, scheduled to get under way at the end of this month. The UAW has announced it will demand big things, and has been talking tough about its determination. Automakers, closest to being in the driver's seat for the first time in a long time, have talked back just as tough.

It seems a lot of people intend to hold onto their money until they're sure their income is going to be steady through the spring.

Price Probers Hit Steel Rise

Senate subcommittee says last summer's price boost was not justified.

U. S. Steel blasts report as "thoroughly biased and distorted."

▪ As expected, Sen. Estes Kefauver's price probers feel the steel industry should ignore the economic facts of life and quit raising its prices to offset increasing costs.

In a report that apparently avoids mentioning the chief reason for last summer's $6 per ton price boost—higher employment costs—Sen. Kefauver's Antitrust and Monopoly Subcommittee said the price hike was not justified, that it "substantially exceeded" cost increases.

The Background—The committee's report followed hearings held between Aug. 8 and Nov. 5 last year, during which testimony was taken from U. S. Steel Corp., Bethlehem Steel, National Steel, the United Steelworkers of America and various economic experts. Senators Dirksen and Wiley dissented.

The report criticized the steel industry for lacking responsible leadership" and asked the Antitrust Div. of the Dept. of Justice and the Federal Trade Commission to look into the possibility of antitrust violations in steel pricing.

U. S. Steel Replies—Steel company response to the allegations was immediate. Roger M. Blough, chairman of U. S. Steel Corp., called the report a "thoroughly biased and distorted view of the testimony that was presented" to the subcommittee.

"Under the peculiar procedure of this investigation," said Mr. Blough, "the chairman of the committee 'invites' you to testify and then issues a flood of statements to the newspapers denouncing the character, motives and antecedents of your business.

Sen. Kefauver: His report called "thoroughly biased."

Business Prejudged—"He begins the hearing by reading a statement pronouncing your business guilty of all kinds of unsavory practices; after which you are assured in a friendly manner that the committee will now launch a completely unbiased investigation of the facts.

"But when the true facts have been presented, they are ignored or misused, and the chairman and his staff bring in a report confirming all of the preconceived notions set forth in his opening statement. This proves he was right all the time.

How To Go Under—". . . the only competent testimony in the record is that price rises did not even cover the cost increases."

Are Appliances Due For Upturn?

Even the Most Cautious Expect a Good Year

Sales will begin climbing in May as forecast, major appliance makers say.

New housing starts and low dealer inventories are added assurance.—By K. W. Bennett.

▪ Recent layoffs in the appliance industry are pegged more on extreme caution than a lack of confidence in the market. Major appliance makers actually expect to gross about as much in 1958 as they did in 1957. A few manufacturers look for a gain of as much as 4 pct on several appliance lines.

When GE recently announced a one-week furlough of 3800 workers at Appliance Park, the point that this was an inventory readjustment and that full production would resume March 31 was lost in the general alarm.

Some Show Gains—Lost sight of also was the fact that at least two major producers have added to their work force in the same period. A third will advance production levels by 5 pct in the second quarter.

The real villain of the piece is that the downward adjustment of finished goods inventories is still continuing in a number of major appliance firms. One producer is off 60 pct from operations in first quarter of last year. Another cut factory operations by 30 pct last November, though retail dealer sales of the finished appliance were off by only half this amount.

Ranges Hard Hit—Dealers began cutting their purchases from appliance makers last summer. But the really drastic cutting didn't begin at the dealer level until November of last year. Home laundry shipments from manufacturer to dealer last year were off 17.6 pct on a monthly average from the booming levels of 1956.

Of eight major appliances, the average was 10 pct in manufacturers' dollar sales volume. Hardest hit were ranges, off 12.5 pct. Air conditioners were hit the least, off 4 pct.

Sales Exceed Shipments — With the big selling seasons for most major appliances still well in the future, dealers are continuing to sell an estimated 5 pct more appliances than they receive from the factory each month.

The real selling season doesn't begin until June, and then carries through virtually all the way to December, with ranges, refrigerators, freezers, air conditioners, washers, and dryers each hitting their normal sales peaks in that period and in about that order.

Cause for Optimism—Factors already stacking up on the credit side of the ledger include substantial reduction in dealer-distributor inventories, a pickup in housing starts, and tighter finished goods inventory controls.

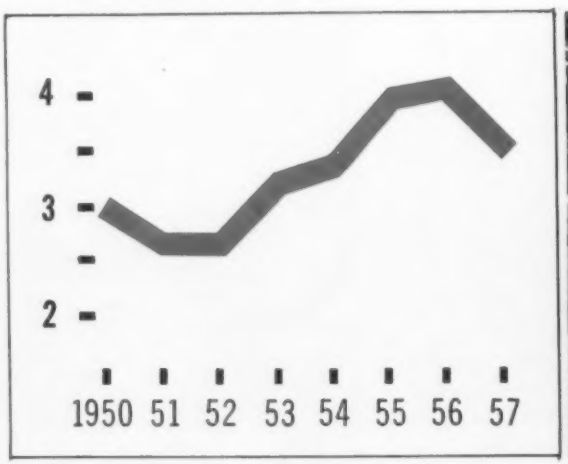
While appliance men argue that gloomy newspaper reports probably overplay the extent of manufacturing cutbacks, they themselves are displaying unusual caution. "We regard our finished goods inventories levels as highly satisfactory" is a common phrase. Nonetheless most are holding to inventory levels based on the minimum sales forecast.

Playing It Close—Equally, their own purchases are still based on reducing raw materials and component inventories that are already bone-bare and based on 2-4 weeks' steel mill deliveries. In a number of cases, finished goods inventories will be allowed to sink to lower levels through March, and April—right up to the brink of the selling season.

It all points to an upturn in appliance manufacturing levels in second half. Even if only the minimum sales forecast is borne out. Last year was not a good year. Yet home

Will Appliances Get Second Wind in '58?

Retail Sales—Billions of Dollars



laundry sales rose by 52 pct in third quarter over second. The inventory buildup at the factory level is being wiped out.

Refrigerators, big dollar item in the appliance list, was cutting back in early third quarter. Ranges, not normally a seasonal item, advanced by 6 pct in third quarter last year over second quarter manufacturing sales. Yet at present they are regarded as a low item in inventory by many producers.

Outlook Hopeful—There's more of extreme caution than there is of real business cutback in the current appliance outlook. And to hit even their current forecast, manufacturers are going to have to step up operations.

If there is a real business upturn, they'll be fighting to make deliveries. After May, appliances will bear careful watching. Despite the current gloom, this could be a hot year.

Electric Companies Report Earnings

The two major electric companies released their annual reports for 1957 this week.

General Electric—General Electric reported new highs in both sales and earnings. Net sales totaled $4,335,664,061, up 6 pct from the previous high in 1956.

Net earnings were up 16 pct to $247,851,871.

Ralph J. Cordiner, GE president, said that sales of defense products accounted for about one-fifth of the total.

Westinghouse — Gwilym A. Price, chairman of the board, and Mark W. Cresap, Jr., president of Westinghouse Electric Corp., pointed out that company sales passed the $2 billion mark for the first time—$2,009,043,000. This is up 32 pct over 1956.

Net income amounted to $72,652,000, compared with $3,492,000 earned in 1956.

DOWN THE BELL: Camera is lowered into banked CF&I blast furnace.

How To See Inside A Blast Furnace

▪ Remote control photography is used at Colorado Fuel & Iron Corp. to determine when it's time to reline blast furnaces.

Blast photographers Frank Sluder and David Roscover developed the camera technique of photographing the stock line armor inside of two CF&I furnaces.

A Few More Casts—Both were due for relining, but John Monson, superintendent of the Blast Furnace Dept., considered the possibility that one might be good for a few more casts. He needed a quick, inexpensive way to find out.

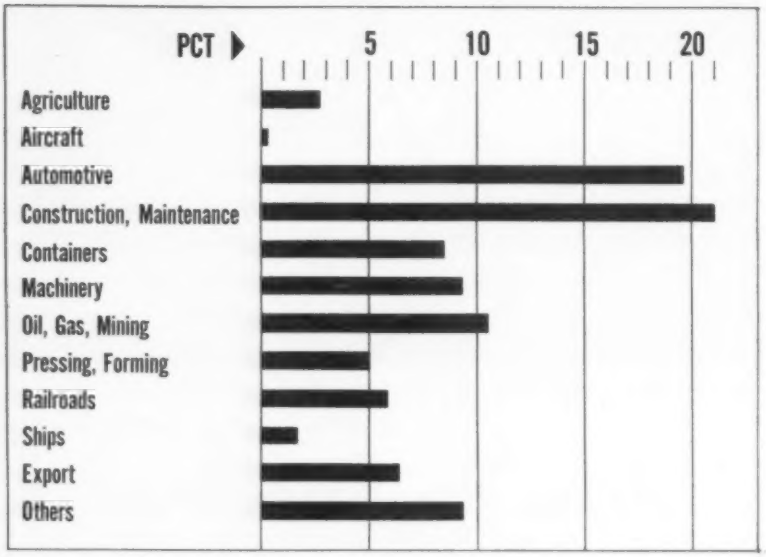
The camera was mounted in a strong carboard box and lowered into the furnace. Drawings were examined to determine the depth.

New Tool—After one failure because of error in synchronizing, a second set of pictures showed furnace "A" did need re-lining. Furnace "E" has also been photographed successfully, and the pictures are being interpreted.

CF&I people believe the technique opens up new areas of use for the camera in steel mill photography and widens the range of the camera as an industrial tool.

THE EVIDENCE: Pictures show that re-lining of furnace is in order.

Big Steel Users in 1957—Pct of Total



Builders Paced Steel Users in 1957

Mills shipped 79.9 million tons of steel in 1957, more than 3.3 million tons below 1956 levels.

Gains over purchases in '56 were made by shipbuilding, export, and mining.

▪ The construction industry last year retained its position as the nation's largest steel consumer.

The builders, who took over the lead from automotive in '56, again accepted more than one-fifth of all the steel shipped. However, the 16.5 million tons they bought was a decline from 1956 consumption of 16.7 million tons.

Automotive Second — Automotive steel buyers, according to an IRON AGE analysis of shipments reported by the American Iron and Steel Institute, again finished in second place. They received 15.7 million tons of the 79.9 million tons shipped to all industry and export. The figures in each case include shipments from producing mills, warehouses and distributors.

Few industries bettered their steel purchases last year when total steel shipped declined by 3.3 million tons from the 1956 level of 83.2 million tons.

Lower Totals for Many—Industries registering gains over '56 included shipbuilding and combined usage by oil, gas, and mining consumers. Export shipments were also up by more than 24 pct.

Lower steel purchasing was recorded by such industries as machinery, containers, pressing and forming, aircraft, and agriculture. Steel usage by the railroads remained at 1956 levels.

Purchasing by the third largest consumer, oil, gas, and mining, rose by 9 pct to 8.3 million tons as compared with 7.6 million tons in '56.

The machinery industry which bought 7.3 million tons in 1957 showed a 14 pct drop from the 8.5 million tons purchased in 1956. Containers, at 6.8 million tons in '57, declined slightly more than 10 pct below the 1956 figure of 7.6 million.

A more substantial drop was made by the pressing and forming industry, down more than 24 pct from 5.3 million tons in '56 to 4.0 million tons last year.

Steel Distribution by Consuming Industries

In Thousands of Net Tons

	1951		1952		1953		1954		1955		1956		1957	
	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct	Tons	Pct
Agriculture	3,281	4.16	2,764	4.07	2,547	3.18	2,417	3.83	2,802	3.3	2,456	3.0	2,236	2.7
Aircraft	167	.21	153	0.23	180	0.23	97	.15	107	.12	153	0.2	110	0.14
Automotive	14,488	18.36	12,232	17.99	16,506	20.59	12,959	20.52	20,834	24.6	15,962	19.2	15,788	19.7
Construction and Maintenance	14,184	17.96	11,749	17.28	14,225	17.75	12,906	20.44	15,611	18.4	16,734	20.1	16,514	20.8
Containers	7,242	9.18	6,218	9.15	6,769	8.45	6,427	10.18	7,462	8.8	7,650	9.2	6,895	8.6
Machinery, Tools	7,033	8.92	6,131	9.02	7,307	9.12	5,802	9.19	7,854	9.3	8,466	10.2	7,355	9.2
Oil, Gas, Water, Mining	6,735	8.54	5,973	8.78	7,211	8.98	6,097	9.65	7,336	8.7	7,620	9.2	8,304	10.4
Pressing, Forming, Stamping	4,617	5.85	3,640	5.35	4,994	6.23	3,828	6.06	5,295	6.3	5,347	6.4	4,076	5.0
Railroads	6,558	8.32	4,575	6.73	5,454	6.80	2,780	4.40	3,989	4.7	4,815	5.8	4,665	5.8
Shipbuilding	981	1.25	1,152	1.70	976	1.22	549	.87	667	.78	853	1.0	1,412	1.7
Exports	3,068	3.89	3,665	5.39	2,998	3.74	2,774	4.39	3,583	4.2	4,063	4.9	5,050	6.3
All Others	10,573	13.40	9,750	14.34	10,985	13.71	6,517	10.32	9,186	10.8	9,138	11.0	7,485	9.2
Total	78,929	100.00	68,004	100.00	80,152	100.00	63,153	100.00	84,717	100.00	83,251	100.00	79,894	100.00

IRON AGE compilation and distribution formula from data by American Iron and Steel Institute.

Long-Term Ore Projects Stirring

Projects Go Ahead Despite Steel Slowdown

In the midst of a steel recession, steelmakers make big plans for 1975 iron ore.

J & L joins Canadian parade while M. A. Hanna flirts with Brazilian ore project. Export eyed.—By Tom Campbell.

▪ While steel sales managers bolster up their men's spirits with new sales pitches, the front offices are making plans for iron ore demand in 1970 to 1980.

All at once, when ore shipments are on the brink of quite a slideoff this year, the trade is buzzing with the most important talk in years.

The two firms out front this week are the M. A. Hanna Co. and Jones & Laughlin Steel Corp.

First off the bat, M. A. Hanna will spend millions and at least a year and a half's hard work in Brazil near Belo Horizonte, site of the most fabulous ore fields in the world. The Fe content runs between 60 and 70 pct out of the ground. It will take at least a year to determine if the Brazilian iron ore can be mined and shipped in a competitive world market.

Lots of Study — Top level officials, geologists and drillers are scheduled to commute between Cleveland and Southeast Brazil as basic plans are made to determine if $300 million or more is to be spent developing a new open pit ore field. If the project goes through, it will mean that 50 to 65 pct of the ore will go to Europe and the balance to the United States.

The big stumbling block may be the transportation problem. M. A. Hanna, which, with Leo Model and Associates of New York, has taken control of the 125 year old British company, St. John d'el Rey Mining Co., expects to survey: Cost of a 300 mile railroad; dock cost and feasibility; cost of transportation of ore to European and American markets; type of ore; potential open pit tonnages; town site costs; special problems of loading and unloading when using new ore carriers in excess of 45,000 tons; study of government trends; ability to obtain the money needed for a commercial exploitation of this lush ore.

Lots Going On — While M. A. Hanna is embarking on this large-scale study, with a good chance of bringing it into wide-scale operation, it is making firm plans to bring in the Iron Ore Co. of Canada's Wabush Lake concentrating project in Labrador, not far from its railroad.

The Wabush plans are pretty much set to go. If things turn out as now expected, the Iron Ore Co. of Canada (6 American steel firms, M. A. Hanna, and Hollinger Gold Mining Limited with its concessionary firms) will be shipping 65 pct iron ore concentrate by 1963. The cost will go well over $100 million with extra track, mine layout, townsite, concentrating plant, and additional rolling stock.

J & L's Plans—The Jones & Laughlin deal involves an option which has been taken up on property in the vicinity of Mt. Wright in the Province of Quebec (near property now held by Quebec Cartier—U. S. Steel subsidiary.

With Cleveland Cliffs as a partner, J & L has staked out its part of the iron ore concentrates in an area which abounds with excellent structured low grade iron ore. Thus J & L joins the parade of steel people who hope to bypass the building of an extra blast furnace in the future by using a much greater percentage of 62 to 65 pct iron ore concentrates.

While J & L says there are no immediate plans for mining, activity will take place when either the U. S. Steel railroad from Shelter Bay below Sept Iles, Quebec, is built or when a spur line to the Quebec, North Shore and Labrador is completed.

By 1963—Best guess on action in the whole Labrador and Quebec

Iron Ore Quest On Two Continents

regions involving concentrated ores is 1963.

The U. S. Steel project is well along in its initial stage in Quebec. (The IRON AGE, Nov. 29, 1956.) Latest news suggests a firm program which will be completed by 1964. It involves a private railroad to a point near Mt. Wright, Quebec, and other major facilities.

Supplements Cerro Bolivar—This U. S. Steel program is considered as a supplement to open pit operations at Cerro Bolivar in Venezuela. As a rule, U. S. Steel does not become part of an ore project unless it can take most of the product itself, in view of its size and requirements—as well as its need to look a hundred or more years ahead. The Quebec Cartier firm—U. S. Steel's Canadian subsidiary—is on excellent terms with the Quebec Province government. It is expected that the company will—by the time the project starts producing concentrated ore—have invested close to $300 million.

Look to Export — Most of the steel firms and the Cleveland ore companies have their eyes on Europe and Great Britain as customers for what ore they do not need themselves. The Ungava project—in the far north of Quebec—sired by Cyrus Eaton, is close to a firm basis. West German firms are in the project with Steep Rock, Cleveland Cliffs and Mr. Eaton.

Bethlehem Acts—During the melee of ore news, Bethlehem Steel Co. stepped into the Iron Ore of Canada setup by taking about 900,000 tons a year of Republic Steel's commitments.

This latest move of Bethlehem's in IOOC iron ore is in addition to the long-term contract Bethlehem has with Hanna for about a million tons a year at maximum deliveries.

Still in the race in Venezuela is the El Trueno project involving an ore mountain near U. S. Steel's Cerro Bolivar. The El Trueno project has been stalled recently, but latest reports see it off the ground sometime this year, with ore coming out in 1959 or 1960.

King-Size Tooling For Big Jobs

Machining pieces that weigh more than a ton is a big job from any viewpoint.

Rockford, Ill., company developed its own layout that cut costs, saved time and space.

▪ The assignment: Cut tooling costs and production time on a workpiece that weighs well over one ton.

W. F. and John Barnes attacked the elephant-sized problem with machines of equivalent size.

Step by Step—The Rockford machine tool builder has evolved solutions that (1) cut equipment outlay by 50 pct over a conventional machine layout for tackling the workpiece in question, (2) did the necessary engineering job on a competitive bid basis with conventional tooling, and (3) came up with a machine line that reduces required plant space by 80 pct.

In a custom-built series of units, Barnes built six machine tools that replace a 24-machine tool production line. The series is capable of high output, high precision production of massive machine parts.

The six-tool Barnes line of king-size milling-and-drilling machine must whittle a one-ton workpiece to tolerances of .001 inch or less, must machine five surfaces of the heavy, box-shaped workpiece including the interior, must drill holes in the workpiece on centers of less than .001 inch tolerance.

How It's Done—Secret of the economic, yet heavy duty machines is that drilling, reaming, chamfering, tapping, and milling operations have been placed on a six-station rotary table on each machine. The number of stations varies from four to six, but the result is to offer an unprecedented number of working heads to attack the workpiece.

For instance: One rotary work unit has five working faces offering 164 head spindles, four reaming spindles, 57 drill spindles, 2 boring spindles, 53 tapping spindles, and 47 chamfering spindles.

Big Units—The machines as constructed are no lightweights. The tool carrying table on one typical unit weighs 42 tons, spins to a new indexing position with a precision .003 in. indexing clearance above the indexing table.

The tools themselves offer a considerable variety of arrangements. On one rotating tool, the workpiece approaches the correctly indexed tool face from a single feed table. On a second tool, the feed table is mounted between two of the indexed, tool mounting rotating units. On a third tool, two feed tables feed into a single rotating tool-bearing unit.

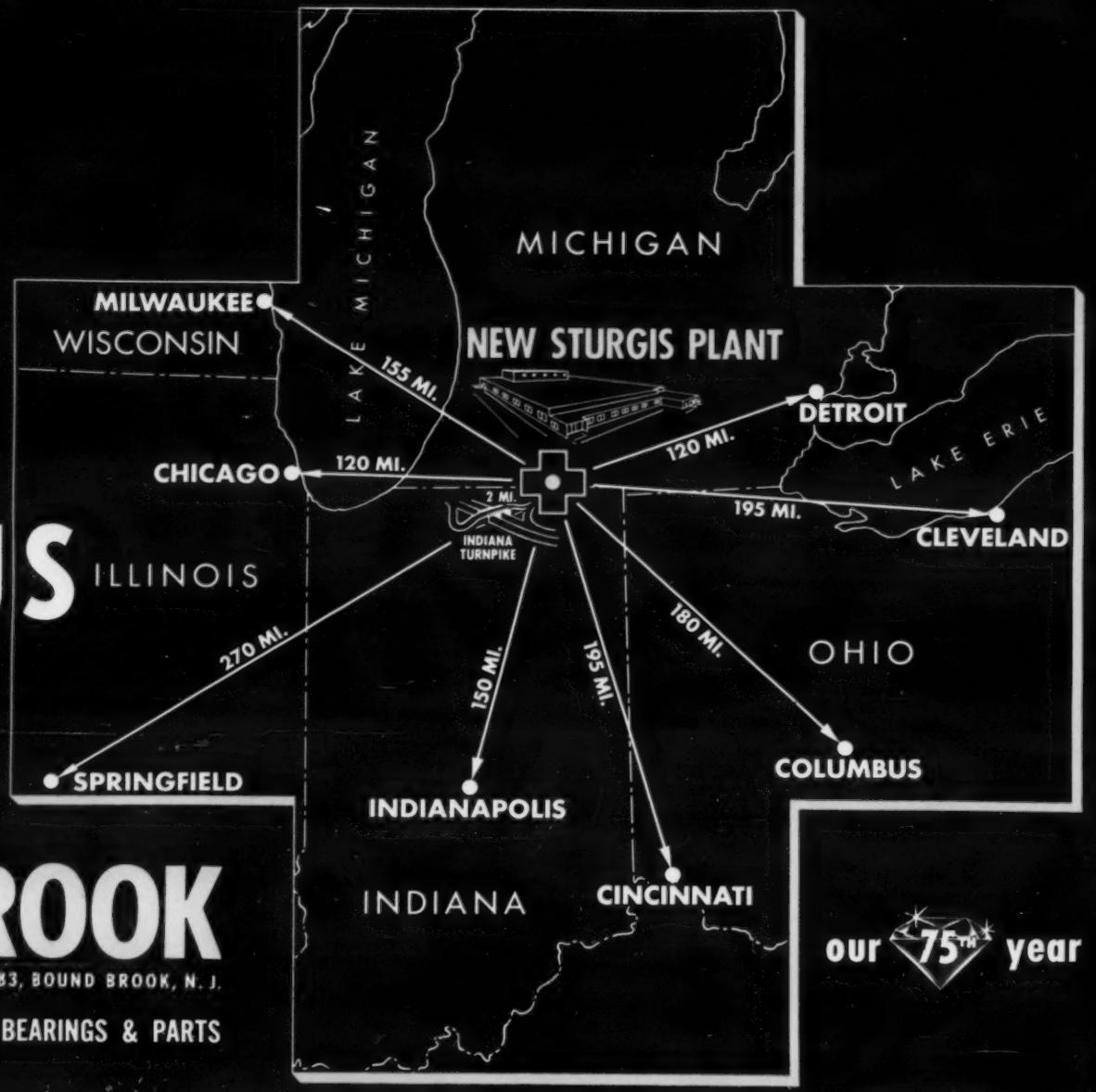
It's Competitive—The big machines appear highly specialized, yet it is important to note the Barnes attacked the complex engineering job on a competitive bid basis with production lines built up of conventional tooling. The custom-designed, rotating, multi-tool behemoths, despite the engineering outlay involved, were able to beat out the conventional tooling.

More Details Listed—The gang machine operations are controlled by single control pulpits—a single set of controls for all six machining heads of the individual machine tool. Electrical system check points have been moved to an "off-machine" site should the tools be readapted for new work.

NEWS ITEM NO. 3 1958

SERVICE FROM STURGIS ANOTHER BIG PLUS

This second plant, now under construction, makes Bound Brook your neighbor. Deliveries possible within hours — any place — in the great industrial belt of the United States.



BOUND BROOK

BOUND BROOK OIL-LESS BEARING CO., EST. 1883, BOUND BROOK, N. J.

Pioneer in POWDER METALLURGY BEARINGS & PARTS

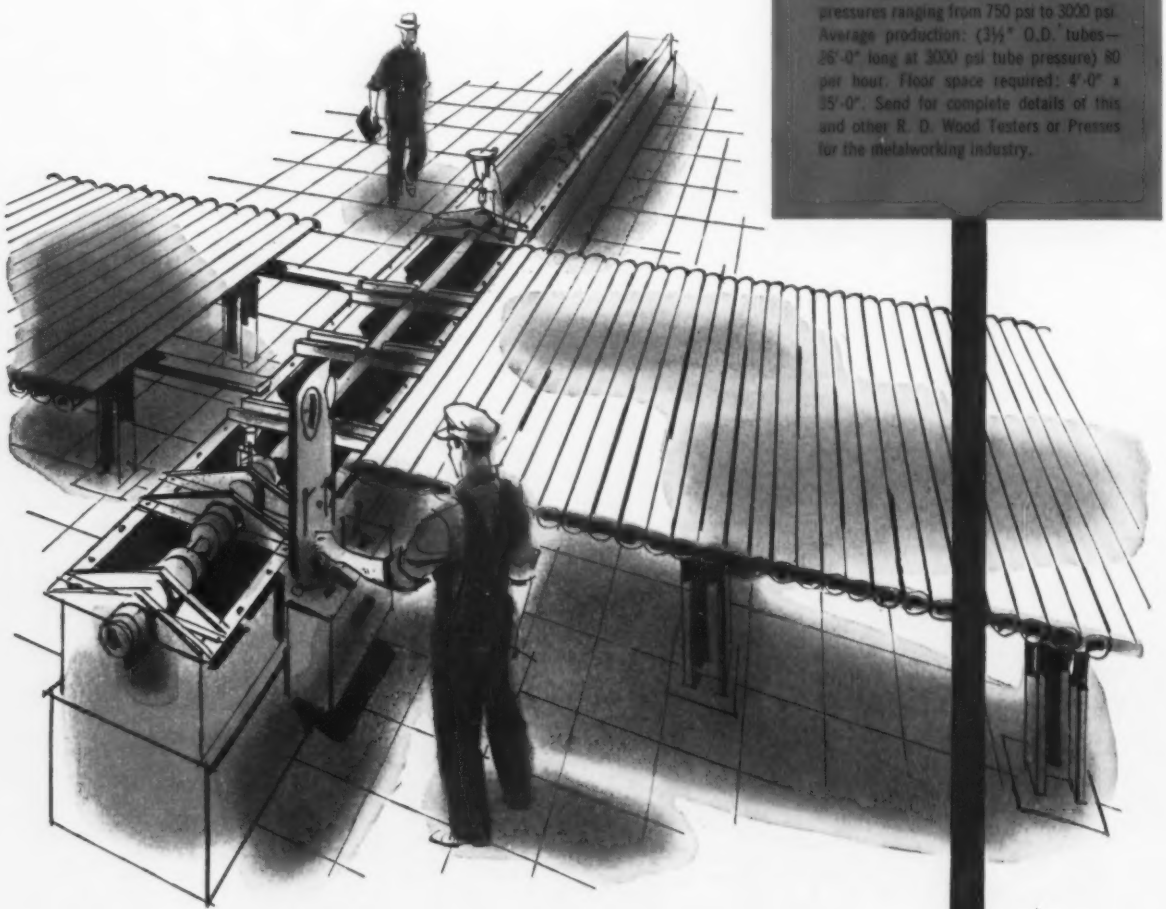
our 75th year

Engineered for Performance

Put a Wood Tube Tester to work and get the money-saving advantages of smooth, dependable performance . . . long operation with low maintenance.

Reason: every Wood Tube Tester is the product of sound design, carefully selected materials, conscientious craftsmanship. This is why Wood Tube Testers and Presses are known throughout industry for their trouble-free operation and fast, economical production. R. D. Wood has many standard tube tester and press designs for a great variety of uses—and engineers others for special work. Write for our catalog and engineering information. No obligation, of course.

R. D. Wood Tube Tester for hydrostatically testing tubes or pipes in sizes from 1" to 4" O.D., lengths from 10'-0" to 26'-0"; at test pressures ranging from 750 psi to 3000 psi. Average production: (3½" O.D. tubes—26'-0" long at 3000 psi tube pressure) 80 per hour. Floor space required: 4'-0" x 35'-0". Send for complete details of this and other R. D. Wood Testers or Presses for the metalworking industry.



R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

PA's See Some Hope For Improvement

A survey group of the National Assn. of Purchasing Agents confirms what everyone knows—"business right now is not good." But the committee says there is concrete evidence that the "thread of optimism reported in January may have been more than just whistling in the dark."

The latest survey of members revealed new orders improved for 24 pct, compared to only 15 pct the month before. Only 31 pct said orders are off, compared to 48 pct in the previous poll.

Here's the way NAPA sees the current situation in regard to other factors.

Commodity Prices—Competition is forcing prices of industrial material down. The weakness, evident in raw materials for some time, is now spreading to manufactured goods.

Inventories — Most purchasing agents are still trying to reduce the stocks of materials on hand. About 46 pct say they have been able to effect reductions in the last 30 days. The 15 pct who have more material on hand say it is due to reduced production schedules.

Employment — Layoffs are extensive, with 57 pct reporting smaller payrolls. Only 8 pct reported gains in employment since January.

Nothing was in short supply in January, said the committee.

Cut Favoritism On Defense Contracts

The Pentagon, smarting under charges of favoritism in the awarding of defense contracts, is writing a new regulation to prohibit the award of any contract to members of the families of high government officials.

Congressional investigating committees have been particularly critical of the defense contracts that have gone to families and friends of top-ranking officials in the Eisenhower Administration. Under extended prodding from these investigating groups, the Pentagon is now writing a restrictive new rule to stop the practice.

Still Rolling Along

More than 83 pct of all Pontiac automobiles built since World War II are still in operation today. Passenger car registration figures indicates 3,400,000, 1946-1958 Pontiacs are currently on the road. This is the fifth best record in the auto industry, the firm said.

Largest Jeep Order

Willys Motors has received the largest single order for Jeep vehicles from the United States government since World War II. The order, amounting to $3,108,227, is for 1763 Jeeps and parts. They were purchased by the International Cooperation Administration for delivery to the government of India under the U. S. mutual security program.

Unfair Labor Charges Hit New High

A record number of unfair labor practice cases were filed with the National Labor Relations Board in the last quarter of 1957.

The NLRB said the 2095 cases were up 73 pct from the 1208 filed during the same period in 1956, and up 29 pct over the third quarter 1957.

High Against Both — Both the number of cases filed against employers and against unions registered new highs. Employers were charged 1379 times, unions 716 times.

NLRB believes the sharp rise was due mainly to the substantial increase in the number of cases filed by individual employees.

Picketing the Picketers

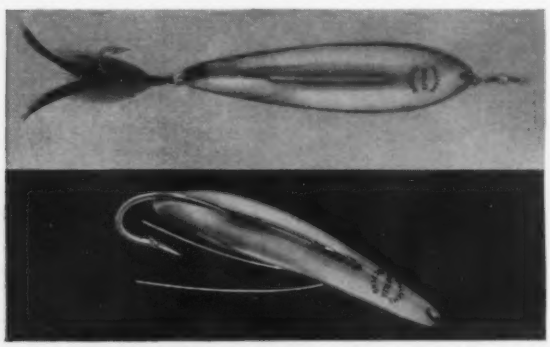
ONE MAN'S REVOLT: James Sweeney, organizer fired by the AFL-CIO, pickets headquarters of the union. The organizer says the union did just what labor unions have been fighting against in firing himself and 54 others.

NEW BRASS CUTS POLISHING COST

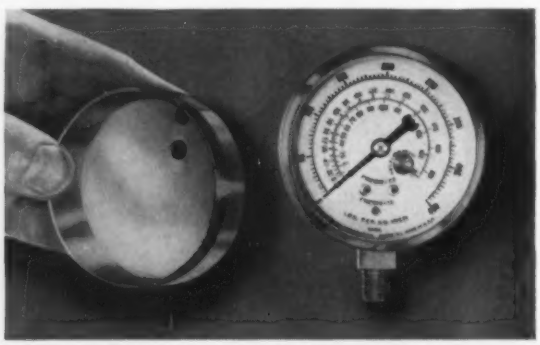
also gives you clean, easy drawing and forming, plus higher physical properties—Formbrite,® Superfine-Grain Drawing Brass by Anaconda

AIRGUIDE Instrument Co., Chicago, gets high luster finish on bezels for its famous weather instruments at 50% lower cost since it switched from ordinary drawing brass to Formbrite. Airguide does the presswork—says Formbrite "draws and forms excellently." Driscoll & Co. (above) polishes the bezels.

BAROMETER in Chippendale style, "Mayfair," is one of the broad line of brass-trimmed instruments made for home and marine use by Airguide.



FISHING LURES made by Williams Gold Refining Co., Inc.—"Wabler," top and "Weedler," below—are polished for plating by tumbling. Switching from ordinary yellow brass to Formbrite cut costs more than 40%.



MARSH Instrument Co., Skokie, Ill., dropped a finishing operation and gets a "mirror finish" with a light buff, by using Formbrite. Marsh reports that finishing cost was cut 40% and that forming is "excellent."

Wherever finishing is an important cost factor in formed or drawn products, Formbrite in sheet and strip is designed to save you money. In brass wire alloys for cold-heading and upsetting, it gives a stronger, springier, more abrasion-resistant product. For more detailed information, write for Publication B-39. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

FORMBRITE

SUPERFINE-GRAIN DRAWING BRASS

a product of

ANACONDA®

Made by The American Brass Company

Hugh J. Morrison

He Cultivates Company Loyalty

Employee attitude is an important factor in the success of any company.

Mr. Morrison looks at the other side of the coin, too. Company loyalty has personal rewards.

■ "The only way a man should look at his job is with the realization that his personal future is tied in directly with the future of the company he works for." So advises Hugh J. Morrison, who tied in with the Aluminum Company of America nearly 30 years ago.

"If the company prospers, its employees prosper," he continues. "What a man contributes to his job is what he contributes to himself." To adaptable Hugh Morrison, the knack of identifying himself with a vast, impersonal corporation wasn't too difficult.

A Personal Policy—"Over the years, I've been fortunate enough to put together a policy that works pretty well for me," he says. For instance, when the question of spending company money comes up he tries to look at the proposition as though the money were coming out of his own pocket.

"That way, I think, you never tend to be extravagant just because it's somebody else's money you're handling," he explains.

Starts Young — Identifying himself with his company was aided somewhat by the fact that Mr. Morrison worked for Alcoa as far back as his high school days. During summer vacations he signed on as an electrician's helper at the New Kensington, Pa., works.

He went on to get an electrical engineering degree from Penn State University and in 1929 started full time with Alcoa as a furnace and construction engineer at Edgewater, N. J. It wasn't until a year and a half later, when he was assigned to cost reduction work on impact extrusions, that he caught the attention of company officials.

HUGH J. MORRISON: (right, and son) A job well done pays off.

Steady Rise—From then on Mr. Morrison began a gradual ascent through the engineering ranks into the executive echelon. Recently, he was named assistant general manager of the Fabricating Div.

To his fellow workers, Mr. Morrison is a man who always looks like he's in a hurry but who is never too busy to air a problem thoroughly. His subordinates appreciate his policy of delegating full authority and being content with keeping in touch with general progress.

His Influence—Through the years, Mr. Morrison has had a hand in building many aluminum fabricating milestones. One of his major triumphs was conversion of a New Castle, Pa., steel sheet and tinplate mill into an aluminum forging plant during World War II. The plant was capable of turning out 1.7 million lb a month of aircraft forgings.

While his company spirit is bound to influence the men who work with him, some of it apparently has rubbed off on his son, William, an engineer at Alcoa's Rockdale, Texas, works.

how to rustproof cold rolled steel in shipment and storage

Proved by actual test! Unwrapped steel rusted within a few hours. Identical steel wrapped in Ferro-Pak showed no signs of rust . . . even after several months. Non-toxic chemical vapors from Ferro-Pak coat the steel with an invisible film that makes it impossible for rust to get the slightest foothold.

Even under adverse conditions, such as outside storing or shipping, Ferro-Pak provides complete protection. It is waterproof, strong, yet highly flexible and easy to handle. The chemical rust inhibitor is compatible with oil and stays effective for long periods even when the humidity soars.

Whether you're a shipper or a buyer of steel, it will pay you to specify Ferro-Pak wrapping wherever rust is a problem. For an interesting idea brochure on many uses for Ferro-Pak, write Cromwell Paper Company, 4803 South Whipple Street, Chicago 32, Illinois.

How to rustproof a freight car—Ferro-Pak is used to line sides of car and to interleave coils, transforming ordinary freight car into huge rustproof package.

How to rustproof black plate—On this light gauge, dry, uncoated steel, rust can start from a fingerprint. Ferro-Pak keeps black plate rust-free even when the humidity soars!

FERRO-PAK®
by Cromwell

For over 38 years—
"Paper Engineers" for Steel

Labor Leaders on a Tightrope

Union leaders may have cried "wolf" too often in over-stressing recession talk.

It provides a weak basis to talk up fancy wage increases and fringe benefits.

▪ You can watch labor leaders try to walk a shaky tightrope during the remainder of the recession. In fact, some may be off-balance now to the point of having trouble staying on top.

The point is, they have talked too much depression. In an effort to dramatize the hardships of members, they have stressed and exaggerated the gloomy side of the picture.

Cried Wolf — They may have gone too far in depression talk. They apparently forgot that there are many contracts to be negotiated this year. Too much recession talk is a poor background to open up a wage negotiation if the union expects to get any significant increase.

Public opinion is now swinging against the prospect of fat wage increases, in view of the current business situation. For a time, and they probably will continue to do so, labor leaders kept to the line that wage increases would stimulate business activity and, therefore, be the best anti-depression medicine.

Stuck With It—That now has a hollow ring, but labor leaders are still stuck with it. Just this week Walter Reuther called for Federal minimum standards for unemployment compensation benefits and duration as well as Federal authority to declare a temporary moratorium on income tax withholding.

Again, these pronouncements are not the kind of thing you'd expect before a demand for a healthy wage increase when the UAW starts negotiating with the auto companies later this spring.

Now, a Pick-Up—In fact, word from Washington and various state capitals indicates labor leaders are doing some backstage work. In private talks, they are actually predicting a business pick-up by the start of the third quarter.

They are laying a more subtle groundwork to justify wage demands of 10 to 15 cents per hour plus greater security provisions.

And there is no indication that any labor union will follow pleas for "restraint," as asked by the Administration. They will continue to go for the most, and let the chips fall.

. . . Unhappy Membership

Another Trouble Spot — Labor leaders are in a squeeze of another kind, too. In this case, a lot of the membership is beginning to wonder what they are getting for dues money.

It's unlikely that any of the top labor leaders will be unsettled by the current recession, or even a tougher one. George Meany, Dave McDonald, Walter Reuther and most top ranking leaders have solid organizations with depth. They can survive almost anything but graft and corruption, which is unlikely in these cases, at least.

Talk Is Cheap—But a worker who is facing his second month of idleness isn't going to get much soothing from demands on Washington. He knows that Federal or state legislation is a sop at best.

A fellow out of work now is beginning to wonder who, if anyone, gave him a thought when the last contract was negotiated. He is beginning to wonder if job security, after all, isn't his primary goal, not profit sharing.

SUB Helps Little—Supplemental unemployment benefits will help take some of the heat off labor leaders who negotiated them. Even though they are less satisfactory than they were billed, the labor hierarchy can still say, "We had to start somewhere. The next contract will wipe out the inequities."

Organized labor got its strength in hard times, but in recent years has negotiated from a boom times philosophy. A lot of it is not sitting well with the rank-and-file today.

End of a Boom

Latest figures on the Gross National Product show a record $434.5 billion for 1957. But more graphic in view of today's business sag is the rate of decline in the waning months.

GNP reached a peak annual rate of $440 billion in the third quarter, but dropped off to $432.5 in the last quarter as the recession started to pick up speed.

While the dollar rise in 1957 was 5 pct over 1956, real volume of goods and services was up only about one pct. Higher prices for goods and services accounted for a full 4 pct of the increase.

At that rate, the last quarter real output was probably down at the rate of about mid-1956.

Better to Build or Renovate?

Cadillac Found the Answer, But There Were Problems

The problem: More space was essential.

The answer: Modernizing an old plant cost Cadillac only one-third as much.

But moving without losing production time posed a major problem.—By H. R. Neal.

▪ When automobile manufacturers plan expansion programs, they usually think in terms of new facilities designed from the ground up.

GM's Cadillac Division, like many another automaker, has found itself pressed more and more each year for sufficient space. The pinch has made itself painfully felt as Cadillac's production has grown from 61,926 units in the 1947 model year to 146,840 luxury cars in 1957. Size of the cars has also grown progressively.

Renovate—In recent years, the press room has been run on a seven-day week to keep pace with assembly operations. So it would be logical that Cadillac, too, think of a brand-new plant when it planned an expansion program early in 1956. It did—but it didn't build.

There are a number of vacant manufacturing plants in Detroit, ghosts of auto companies and supplier firms that have left the city. Cadillac found it could rehabilitate and modernize an existing plant more economically than building a new one.

It Was Cheaper — By putting about $20 million into the acquisition and modernization of the former Hudson Motor body plant, Cadillac got facilities and space that would cost $60 million new.

But getting into the plant called for one of the most complicated moves in Detroit's industrial history. Cadillac intended to move its entire press shop, screw machine department and rear axle housing fabrication operations. But efficiency and economy demanded the assembly line run at all times in its normal manner.

An intricate schedule was worked out. It required overrunning of presses to cover downtime, or until a press in the new plant could assume operations of the press being moved.

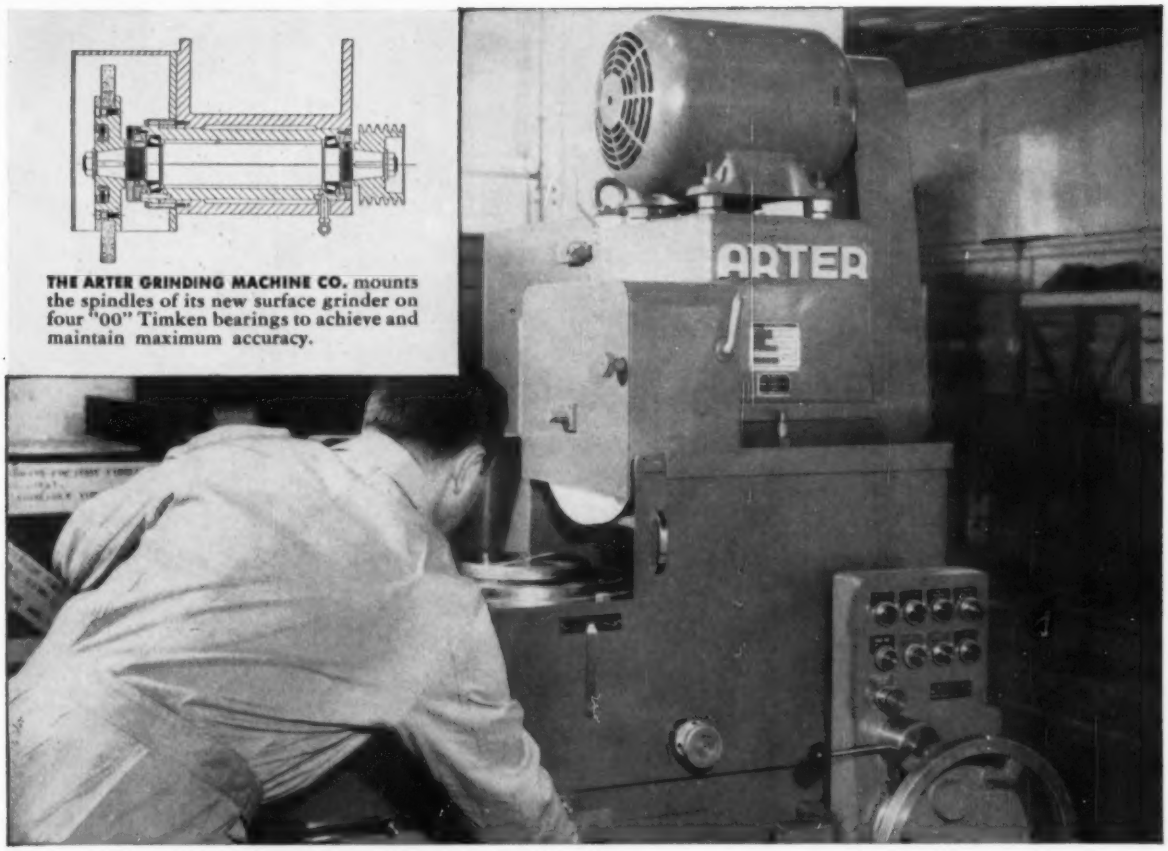
Equipment — Some 350 machines, totaling over 70,000 tons, were moved to the new plant. Of this, 145 were presses. In addition, 64 new presses and 16 other new machines were installed.

Among the new items are the latest types of presses produced by Clearing, Danly, Verson, Bliss and others. They range in size down from the ceiling-scraping, 1250-ton Clearing. Presses in the hood line are equipped with automatic handling devices to feed the presses and move the part on to the next operation. Another important addition is a Wean "flying press" with a special coil feeder. Changing dies enable it to produce a variety of

Before Assembly and After

TRIM AND STAINLESS: 170 pieces of stainless steel are used for trim, wheel disks, accessories, and functional parts of the Dodge line of cars. The Custom Royal hardtop shown uses 47 pieces weighing 20 lb.

THE ARTER GRINDING MACHINE CO. mounts the spindles of its new surface grinder on four "00" Timken bearings to achieve and maintain maximum accuracy.



New precision grinder costs less to make, gives smoother spindle operation with TIMKEN® bearings

TO get the smooth spindle operation required for the extreme precision of their new surface grinder, The Arter Grinding Machine Company mounted the work spindle and the wheel spindle on four "00" Timken® tapered roller bearings. The extremely low run-out tolerances of Timken "00" bearings—75 millionths of an inch—make possible the closest machining tolerances ever achieved. And by using two Timken precision bearings on the spindle, Arter got greater capacity in less space—cut manufacturing costs ⅓ over earlier spindles used.

Timken "00" precision bearings not only deliver highest precision, but like all Timken bearings, they take both radial and thrust loads in any combination. And full line contact between Timken bearing rollers and races gives them extra load-carrying capacity. Shafts are held rigid — accuracy is maintained — gear life increased. Timken bearings run smoothly because they practically eliminate friction. They're designed by geometric law to have true rolling motion and precision manufactured to live up to their design. Normally last the life of a machine they're in.

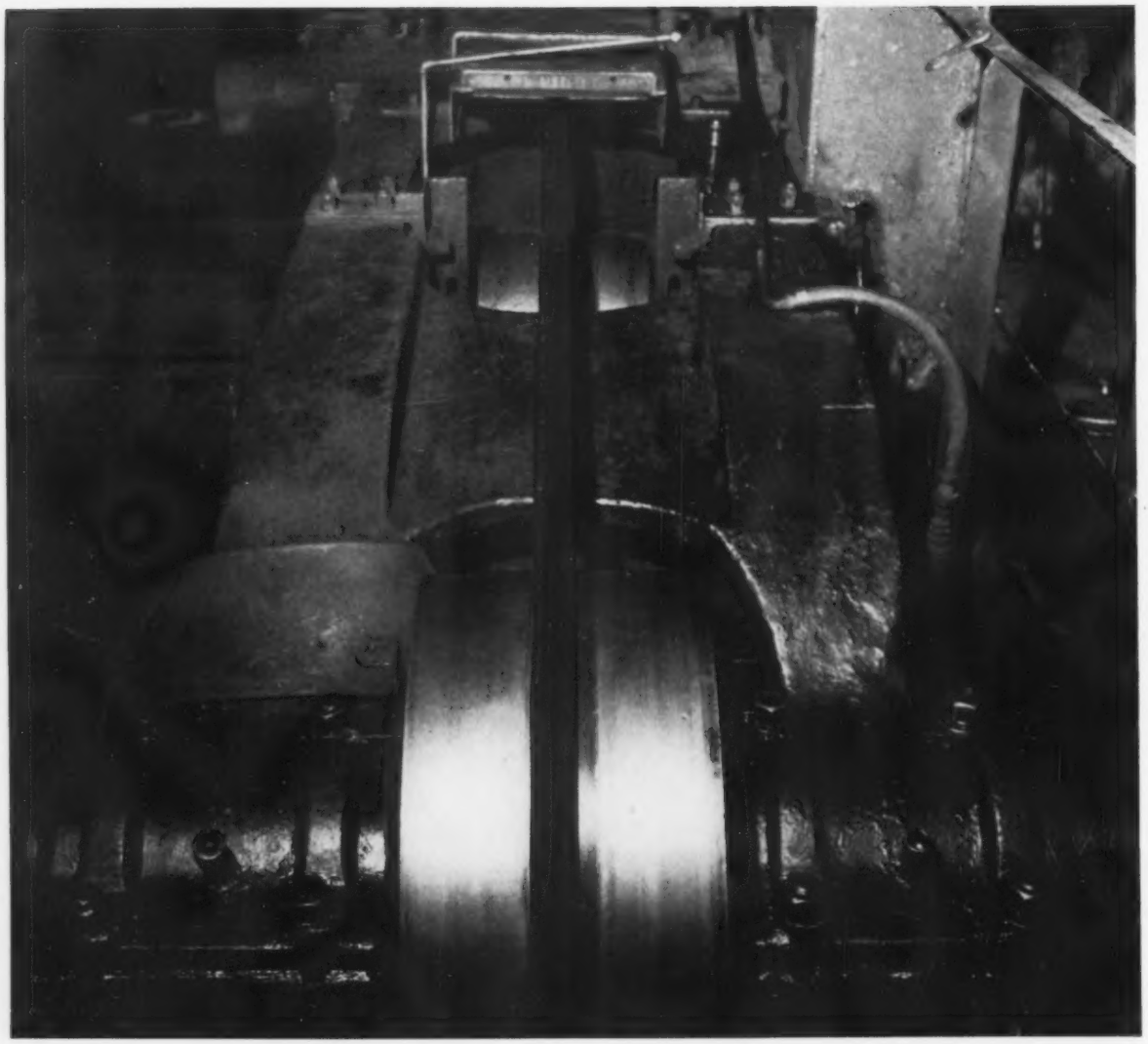
The Timken Company developed "00" bearings to meet the demands of today's new precision machine tools. To produce these bearings, the Timken Company perfected measuring devices of unprecedented precision and developed new manufacturing techniques. The "00" bearing has achieved twice the precision of any previous Timken bearing.

Whatever machines you buy or build make sure your bearings are the best. Look for the trade-mark "Timken" on every bearing and be sure of maximum life, dependability, and minimum maintenance. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

TRADE-MARK REG. U. S. PAT. OFF.



Stretch Eliminated on Hot Saw Drive When 2-inch EXTREMULTUS Belt Replaces 9-inch Belt!

This troublesome drive, in a leading steel mill, had suffered from continual belt stretch and resulting costly down time for take-ups. Replacement of an ordinary 9-inch belt previously used with a 2-inch EXTREMULTUS belt solved the problem completely, with no stretch since installation. In addition, capacity has been increased through elimination of slippage.

On many hot saws, EXTREMULTUS belts are providing years of maintenance-free performance, where previous belts lasted only a few months. The same remarkable properties which have made this possible have permitted the same superior performance on tube mills, shears and rolling mills.

EXTREMULTUS combines a thin elastic core of polymer with an unexcelled friction surface of specially chrome tanned leather. The result is service without maintenance at speeds over 10,000 feet per minute, on loads up to 6,000 horsepower, at bearing loads and belt widths a fraction of those required by other belts.

Write today for full information and descriptive catalog.

EXTREMULTUS, INC.

405 Lexington Ave., New York, N. Y.

Automotive Production

WEEK ENDING	CARS	TRUCKS
Mar. 1, 1958	91,196	18,415
Mar. 1, 1957	140,362	21,743
Feb. 22, 1958	89,977	17,483
Feb. 23, 1957	138,938	23,342
TO DATE 1958	883,098	156,776
TO DATE 1957	1,240,423	190,497

*Preliminary Source: Ward's Reports

blanks for small parts, or finish some 30 stamped parts.

New Plant Production — Some 585 stampings are produced in the plant. Major items include hoods, hood liners, front fenders, bumper sections, stainless steel and aluminum trim mouldings, rear axle housings.

The press shop isn't the only operation that profited by the added facilities. Space released by moving press facilities enabled Cadillac to modernize its engine operations.

It has installed new transfer machine lines for both the cylinder heads of its V-8 engine. A Cadillac official said only the head line could have received the transfer machines in the previously existing space.

Significant Switch — The new transfer lines are completely interlocked, making the cycle automatic from beginning to end. While the equipment and operations are not necessarily new to the auto industry, there is significance in their being adopted by Cadillac.

Automatic equipment must be justified by sufficient production to warrant the high investment cost. One usually associates high price automobiles with low volume production. That's no longer true at Cadillac where output is near the 150,000 mark, enough to earn it ninth spot in the annual auto derby, ahead of at least 10 other makes.

Foreign Car Sales Are Nearing Peak

As sales of domestic automobiles continue to sag, increasing attention is being given to the growing popularity of foreign-built cars. Over 200,000 cars were imported in 1957, most of the small "economy" variety.

Economists, senators, mayors and a number of people, pointing to this trend, have been quick to accuse automakers of not giving American car buyers what they want.

Doesn't Agree — Now, along comes Albert E. Birt, president of Hambro Automotive Corp., New York. Mr. Birt and Hambro sell the products of the British Motor Corp. through a dozen distributors, who have 500 dealers in this country. Mr. Birt, as a champion of foreign-built cars, takes exception with the other champions.

"Sales of foreign cars in the United States might reach 300,000 this year," he said. "If they do, I would think that might be near the top. I don't think they will go on increasing."

British Motor Corp. is no lightweight in the auto business. It is the fourth largest automaker in the world. Among its products are the Austin A-35 and A-55, and the Morris-1000. Other lines include MG, and Austin-Healey.

Peak Production — Mr. Birt's Hambro expects to import 40,000 BMC cars in 1958. This compares with 24,000 in 1957 and only 10,000 in 1956.

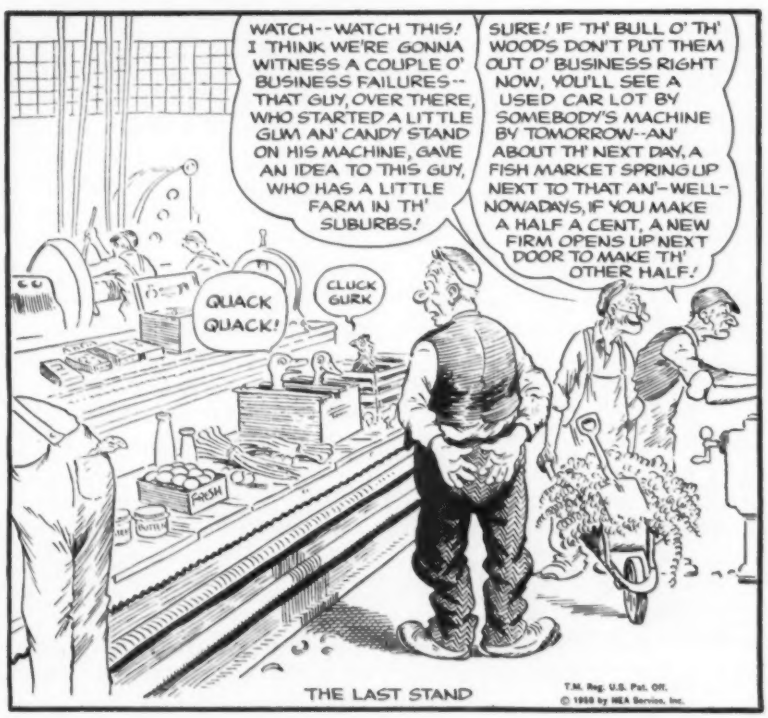
European auto plants are running near peak production.

"Buyers of foreign cars are different, too," he said. "Both the sports cars and the smaller cars are bought by people who form a closer personal association with them."

Rambler Sales Rise

Rambler, a "compact" car, reports sales in the first 10 days of February showed a 65.1 pct increase over the same 1957 period. Sales of 2906 units in the period, compared with 1760 for year ago period, according to an American Motors report. Rambler sales since the beginning of its 1958 model year total 41,515 cars, a 66.4 pct increase over the same 1957 model year.

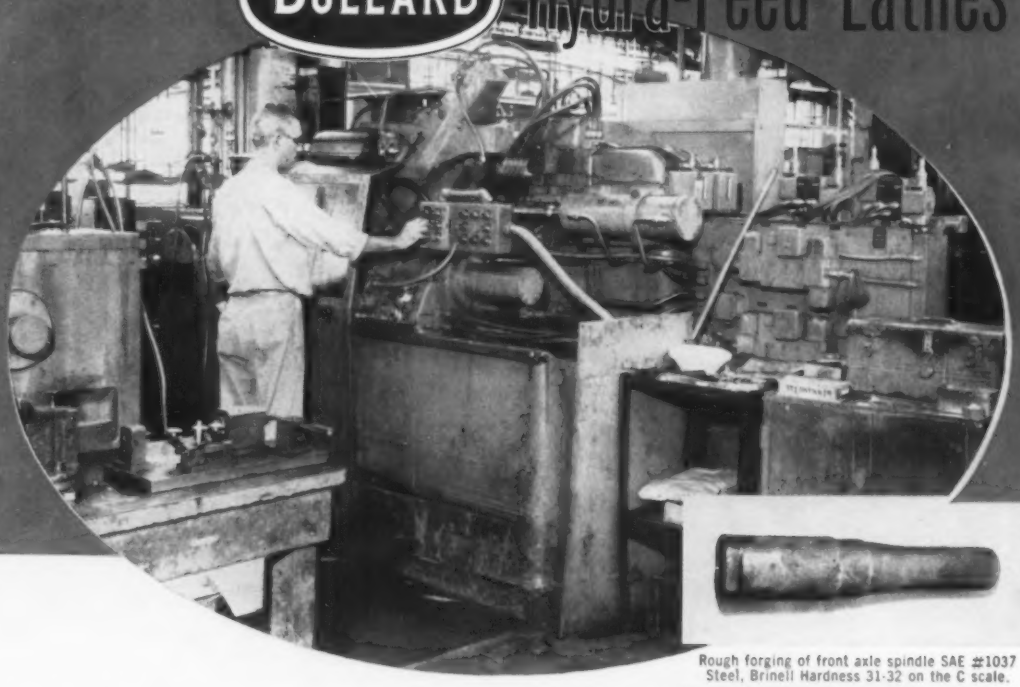
THE BULL OF THE WOODS


WATCH--WATCH THIS! I THINK WE'RE GONNA WITNESS A COUPLE O' BUSINESS FAILURES-- THAT GUY, OVER THERE, WHO STARTED A LITTLE GUM AN' CANDY STAND ON HIS MACHINE, GAVE AN IDEA TO THIS GUY, WHO HAS A LITTLE FARM IN TH' SUBURBS!
SURE! IF TH' BULL O' TH' WOODS DON'T PUT THEM OUT O' BUSINESS RIGHT NOW, YOU'LL SEE A USED CAR LOT BY SOMEBODY'S MACHINE BY TOMORROW--AN' ABOUT TH' NEXT DAY, A FISH MARKET SPRING UP NEXT TO THAT AN'--WELL-- NOWADAYS, IF YOU MAKE A HALF A CENT, A NEW FIRM OPENS UP NEXT DOOR TO MAKE TH' OTHER HALF!
QUACK QUACK!
CLUCK GURK
FISH
THE LAST STAND
T.M. Reg. U.S. Pat. Off.
© 1958 by NEA Service, Inc.

1st Choice

For Versatility and Adaptability

BULLARD Hydra-Feed Lathes



Rough forging of front axle spindle SAE #1037 Steel, Brinell Hardness 31-32 on the C scale.

The Senior Engineer at one of the leading motor car manufacturers in Detroit, was looking for a tracer lathe that went beyond his immediate requirement and offered easy conversion to other uses in years to come, to give longest tool life, to do the job with a minimum of shutdown time, to handle future developments in the realm of cutting tools, to reduce scrap to a minimum.

The answer to this multiple problem, according to the Senior Engineer was "BULLARD HYDRA-FEED TRACER LATHES."

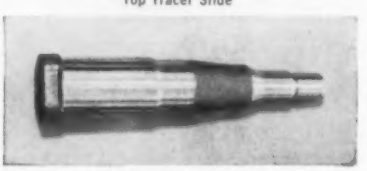
We invite you to investigate the advantages which Bullard Hydra-Feed Lathes, either tracer or multiple tool models, offer you. Phone or write your nearest Bullard Sales Office, Distributor or

THE BULLARD COMPANY

BRIDGEPORT 9, CONNECTICUT

Rough turning with Rear Tracer Slide.

Finish turning with Right-Hand Top Tracer Slide



Finished piece complete cycle time — 65 seconds.

Is Leveling Off Point Here?

You Can't Be Sure for Another Six Weeks

It may be wishful thinking, but you can read some signs of "bottoming out" in statistics.

Defense spending and other government projects will help out.—By G. H. Baker.

▪ Here's some evidence of the coming upturn in business: Unemployment is beginning to level off. Claims filed with the government for jobless benefits have slowed down noticeably in recent days.

As of the end of February, the government estimates total unemployment at about 4.7 million. This is considerably more than the 3.3 million jobless in 1949 (just before the Korean war), but, of course, far below the years immediately preceding World War II (10.3 million in 1938, 9.4 million in 1939, 8.1 million in 1940) or 1933, when the total jobless soared to an all-time peak of 12.8 million.

White House Cheerful — The Eisenhower Administration is betting on a noticeable upsurge in business before the end of June. The White House experts explain this reasoning as follows:

Millions of dollars worth of new defense contracts have been let since January 1, and this new economic activity will soon begin to show up at the factory level.

Farm and outdoor employment always picks up seasonally in March and April.

Construction (both industrial and homebuilding) customarily shows gains after the end of cold weather.

Highway construction is scheduled to move out of the planning stage and into the project stage this spring and summer.

Speed up in production of B-58 medium jet bombers.

The experts warn, however, that we're not out of the woods yet. We won't know for sure that we're on the upgrade for another six weeks.

Speed Needed On Price Decisions

Greater government control over management's pricing policies is in sight. Supreme Court Justice Tom Clark warns that the federal courts are taking far too much time over antitrust cases.

If the courts don't speed their handling of cases, there's going to be a growing clamor for administrative action by the White House.

Need Quick Action — Businessmen hurt by the pricing policies of others can't wait forever for relief from the courts, Mr. Clark says. Unless the courts' processing of antitrust cases is juiced up considerably, there soon will be demands for "executive justice" and "administrative law" as a means of bringing quick relief to parties injured in trust and monopoly lawsuits.

Businessmen Cheer Byrd's Decision

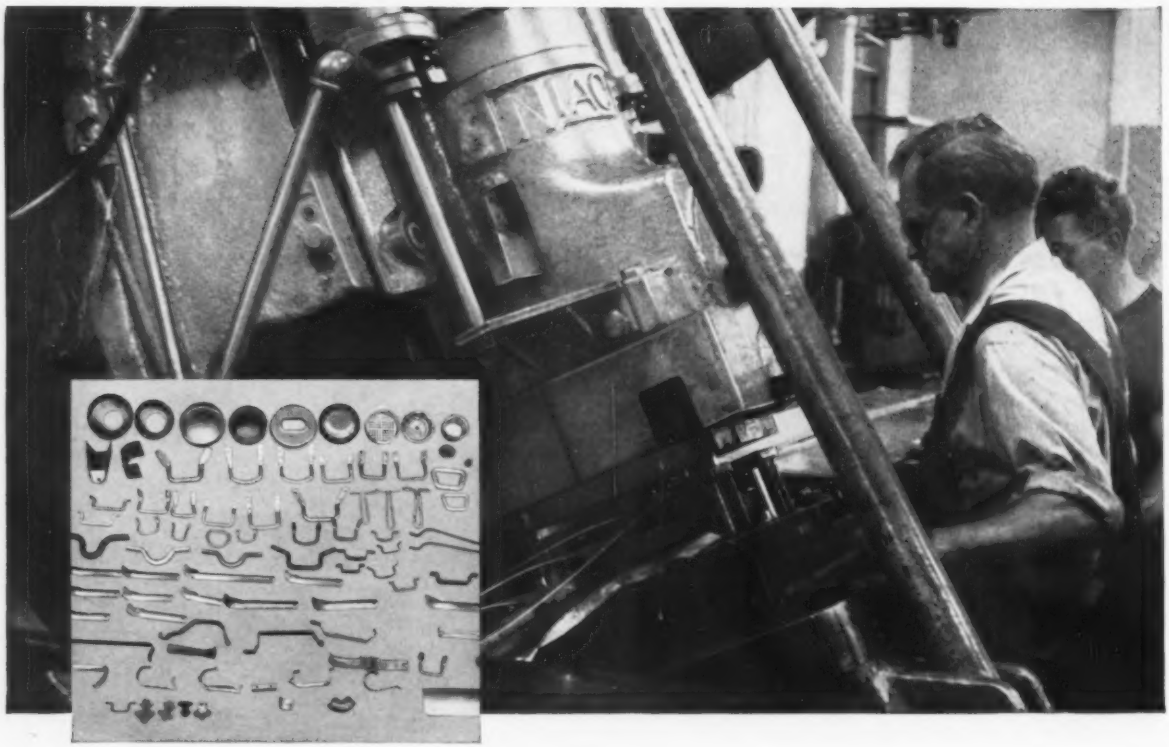
Businessman's Friend — Sen. Harry F. Byrd's decision to delay retirement and retain his post as leader of the shrinking conservative bloc in Congress is producing sighs of relief among many businessmen.

As head of the powerful Senate Finance committee Sen. Byrd has for years been a bulwark against liberal financial, tax, and spending schemes.

The 70-year-old Virginia Democrat, two weeks after announcing he would not seek re-election this fall, announced he would serve another term. His decision was based on the potential havoc his retirement would have played with the century-old political organization he heads in his home state and pleas from conservatives.

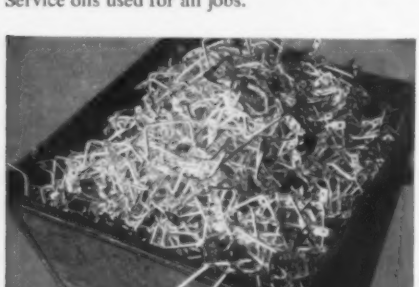
Sen. Byrd, although watching the Senate and his own Finance Committee turn increasingly liberal in recent years, has been a powerful

champion of balanced federal budgets, elimination of unnecessary government spending and payroll padding, reduction in the federal debt, and of lower taxes if they can be secured through lower government spending. He bitterly fought pump-priming, inflationary spending and financing schemes, and political tax juggling.



"We stamp them all using just 2 Cities Service Oils!"

Presses shift to numerous operations without ever changing oil, thanks to versatility of the 2 Cities Service oils used for all jobs.



Handles by the thousands are produced by Res for cooking utensils and similar items. Finish is excellent, thanks to Cities Service oil.

...says Res Manufacturing Company Milwaukee, Wisconsin

It's doubtful if anyone makes a more diversified line of stamped and formed metal products than Res Manufacturing Company.

With its 21 presses, ranging from 15 to 200 tons capacity, Res turns out millions of articles a year . . . wire handles, metal handles, wire forms, drawn shells, lifting loops, and parts for electrical controls, to mention just a few.

"All require the best possible finish and all get it with the use of just two Cities Service oils," says Assistant Plant Manager Herbert W. Krueger.

"For drawing, shaping, and punching aluminum, we use Cities Service Chillo #2 with excellent results. Where drawing, swedging or forming of steel and brass is required, we use Cities Service Chillo 12 and get equally fine results.

"Not only do these two Cities Service oils handle all our jobs and produce the best possible finish, but we also find they increase tool life and hold scrap to a minimum. In short, these are the best oils we have ever seen."

Like Res Manufacturing, chances are your operation can be simplified with the right Cities Service oils. Talk with a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N.Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Management Has Edge on Unions

Aircraft Firms to Talk Tough Over New Contracts

Declining business and rising unemployment are big bargaining guns for management.

A missile-minded government may put on pressure for fast agreements.—By R. R. Kay.

▪ Strike or labor peace? Which will it be for the aircraft-missile industry in southern California?

A strike would raise havoc with the economy there since the industry is the No. 1 manufacturing employer in the region. Some 220,000 workers will be affected by the outcome of negotiations now getting under way.

The two major unions, International Assn. of Machinists and United Auto Workers, AFL-CIO, have a joint program. But they are in a tough bargaining position.

Major Obstacles—Here are the cold facts facing them as they meet with the manufacturers:

(1) Business is declining.

(2) The newly awarded aircraft and missile contracts won't hike employment this year.

(3) Pre-sputnik defense cutbacks have weakened the union's position. They are a bit groggy from huge layoffs — about 40,000 since last summer.

Quick Signing Likely—Management is ready for a tough bargaining battle. It says the cutbacks and cancellations are really hurting, so keeping costs down is vital.

There will be a lot of demands and counter-demands, with both sides claiming they are taking a fair and reasonable attitude. One big factor which may bring both sides to an early agreement is the urgency of the missile program. The ghost of the Government will be seated at the bargaining table.

New Nike Contracts

Douglas Aircraft Co., Santa Monica, Calif., got $49 million in new Army Nike missile business. Contracts call for (1) $43.5 million for more Nike Hercules production and (2) $4.8 million for Nike missile system repair parts and launching items.

West Still Builds

An expert California marketer comments: "I'll bet a good cigar that most eastern metalworkers don't realize how important the Western market is to the construction industry."

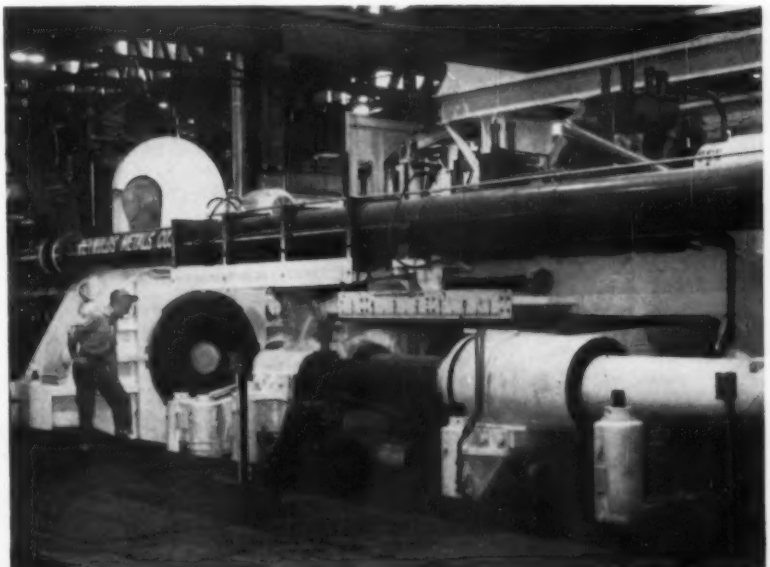
Figures show, he says, that last year $7 billion in construction contracts—21 pct of the nation's total —were in the 11 Western states.

B-70 Five Years Off

Don't look for overnight miracles. You've read a lot about North American Aviation's contract to build the radical WS-110A chemically-fueled bomber.

Now called the B-70, it's said to be our most advanced weapon system. Sounds fine and dandy—but it won't be in use until 1963.

Giant Extrusion Press Gets a Tryout



NAVY RECRUIT: Huge extrusion press measuring 90 x 11 ft was built for the Navy at a cost of $2.5 million. Its 6000-ton pressure will be used to make aircraft shapes at Reynold Metals Co. plant in Phoenix, Ariz.

Here's a MARVEL HIGH-SPEED-EDGE Hack Saw Blade we would'nt sell you!

This blade **could** have been packaged and shipped as a genuine MARVEL High-Speed-Edge Blade . . . and it **might** have performed to a customer's satisfaction. Instead, it was rejected and will be scrapped because inspection revealed a minute imperfection.

There's nothing unusual about this. Certainly, other hack saw blade manufacturers inspect their products, and undoubtedly reject blades for one reason or other, because they are trying to market the best blades they know how to make.

And that's the point—here at MARVEL, where the composite blade was invented and perfected over 30 years ago, we believe we know more about making high-speed-edge hack saw blades than any other maker. We've been at it longer, and the unequalled performance of MARVEL Blades on every kind of material is evidence that we're right.

Use MARVEL Blades on your power hack saws with perfect confidence that they have no equal. You can get MARVEL Blades at your nearby Industrial Distributor.

Write for the new MARVEL Cutting Tool Bulletin.

B-1122

ARMSTRONG-BLUM MFG. CO.
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MARVEL Metal Cutting SAWS
Better Machines–Better Blades

Lean Days Ahead for Builders

Backlogs Are Falling, Buyer Interest Is Low

Incoming orders are bound to pick up in time. The industry is looking for the signs.

In the meantime, they're concentrating on the replacement market.—By E. J. Egan. Jr.

▪ Net new orders for metal cutting machine tools totaled only $19.4 million in January. This blasted any last hopes builders may have had that the start of the new year would see a sharp upturn in the industry's fortunes. They don't see many rays of sunshine ahead, and a backward glance is no fun, either; net new orders in the same month a year ago were a healthy $63.3 million.

Shipments of $48 million in January only reflected the industry's desire to keep workers on the job and beat promised delivery dates to customers who weren't exactly impatient. The shipping rate was hardly in line with new order totals for the past five months, three of which were under the $30-million mark while two failed to reach $20 million.

The Foreseeable Future—Pretty soon now, shipments will have to start sliding, first to $40-million-per-month levels and then below that—unless new orders pick up miraculously.

Incoming business will perk up in time, but it won't be any overnight miracle. It will trail, probably by months, an increase in demand for the things that must be made on machine tools. And that demand, when it starts up again, can be met for quite some time with existing equipment.

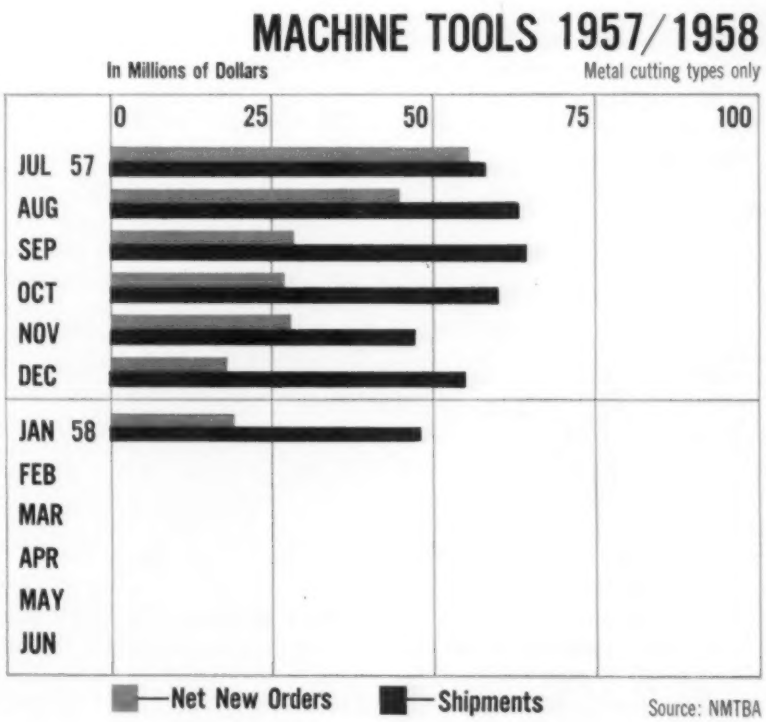
It won't all be done on obsolete or worn-out tools, either. Remember, builders have shipped almost $4.5 billion in new metal cutting machines over the past five years.

Replacement Is Minor—Machine tool makers won't be back in clover until demand for machining capacity outstrips the level that tools in being can handle. This is and always will be the real payoff for a builder—when his customers start adding units to their production lines.

What about replacement business for worn-out machines? What about smash technological developments that can obsolete a year-old tool overnight, Sure, there'll be trickles of business on both counts. With luck, it could develop into a small flood, but still nothing like the orders that come when the metalworking industry throws new plants together all over the landscape.

Fast Service Today—Still, staying alive is the important thing right now, and builders will scratch harder than ever for an order. Wherever a machine shows signs of wearing out and a new replacement is the user's only remedy, you'll find a machine tool salesman ready to conduct a proper funeral and install a new unit—all in the same day.

Moreover, smart builders will keep putting every nickel they can scrape up into research and development. Necessity might spur some startling inventions.



INDUSTRIAL BRIEFS

GE with GM—General Electric Co. will build a $1 million appliance distribution center in Birmingham, Ala. It will be located in the new Irondale Office Park, adjoining the General Motors Co. distribution center now under construction. The GE center, built on a six-acre site will have 70,000 feet of floor space. Warren, Knight and Davis, of Birmingham, are the architects.

Adding Fuel to Fire—The Durez Plastics Div. of Hooker Electrochemical Co. has added gas-burning equipment to the Babcock & Wilcox oil-fired factory assembled boilers at its Kenton, O., plant. It is a move to combat rising fuel costs, while obtaining increased productive capacity.

Variable Valves—A new idea in non-cooled doubledeck reversing valves designed for use in glass furnaces has been introduced by Blaw-Knox Co. Maximum life at minimum cost can be built into the valves by varying the alloy steels from which they are fabricated. The valves can be designed for various operating temperatures. No cooling water is required. Blaw-Knox furnishes the complete package, including the valve seat, damper, hood, lifting mechanism and all required engineering.

"Parting is such sweet sorrow, but we're out of what you want, so come back tomorrow."

Branching Out—The Metal Specialty Co. of Cincinnati, O., has purchased The Nestier Div. of The Charles Wm. Doepke Mfg. Co. It will be known as The Nestier Corp., a subsidiary of Metal Specialty.

Broadening Its Lines—The Federal Machine & Welder Co., Warren, O., has acquired control of the Berkeley-Davis line of automatic arc welding machines. The company is a manufacturer of resistance welding machines and Warco mechanical presses. Federal will increase production of Berkeley-Davis machines and the company's nationwide district representatives will provide a sales organization for Berkeley-Davis products.

And Another Acquisition—Barry Controls Inc. has announced purchase of the physical assets and products of Vlier Engineering Inc. of Los Angeles. Payment for the acquisition was in cash and five year notes. The company will continue its operations as a wholly owned subsidiary of Barry Controls under the name of Vlier Engineering Corp.

Still Another—The Biggs Boiler Works Co., Akron, O., has been acquired as a wholly owned subsidiary by the Union Spring & Mfg. Co., New Kensington, Pa. The subsidiary will be operated under the name of The Biggs Steel Foundry & Fabricating Co., with the present management.

Taking a Bearing—Two new low-cost wheel bearings with a high capacity rating for their size have been developed by The Timken Roller Bearing Co. New products will also fill any possible wheel bearing requirements for the same type of car that may eventually be built in this country. Smaller size bearings will provide additional savings in hub materials and allied parts such as seals and nuts. They are designed specifically for small cars.

Navy Citation—The Navy has conferred its highest civilian honor upon L. D. Miles, General Electric Co. manager of Value Analysis Service. The award honors Mr. Miles for his work in assisting the Bureau of Ships to establish its Office of Value Engineering, the functions of which have resulted in sizable dollar savings for the Navy.

Countdown Starts—A new corporation has been formed to be known as HEF Inc. It was announced jointly by Hooker Electrochemical Co., Niagara Falls, N. Y., and Foote Mineral Co., Philadelphia. The firm will specialize in the manufacture of components of solid fuels for rockets and guided missiles, specifically ammonium perchlorate and other perchlorates.

Solid South—The new $400,000 district warehouse of the J. M. Tull Metal & Supply Co. has been opened in Birmingham, Ala. The 50,000-sq ft structure will be the distribution point for a complete inventory of metals, metal accessories and industrial specialties to Alabama, western Florida, western Tennessee, Mississippi, Louisiana and Arkansas.

Vagabond to Dixie — Contract has been let for construction of a manufacturing plant for Vagabond Coach Mfg. Co. at Alexander City, Ala. Completion is expected in four to six months and the plant will employ from 125-150 people. The company's headquarters is Brighton, Mich.

Cool and Dry — The Mitchell Mfg. Co., Chicago, has appointed the Graybar Electric Co., Inc., Washington, D. C., as the franchised Mitchell room air conditioner and dehumidifier distributor. Graybar will have the exclusive Mitchell franchise in Washington, D. C., and surrounding area.

Paper Work—Taylor Fibre Co., Norristown, Pa., has introduced a new grade of paperbase phenolic laminate. It is designated as Grade 320, and possesses characteristics ideal for use in critical electrical and electronic circuits. The laminate provides low dielectric loss, high dimensional stability, high insulation resistance, and high surface resistivity.

"WEIRKOTE'S ZINC COATING STAYS SKINTIGHT. NO PEELING OR FLAKING—CAN ELIMINATE DIPPING OR PLATING AFTER FABRICATION!"

Q. Sure, but what happens on the tough jobs—like deep drawing or crimping?

A. You can work Weirkote right to the limit of the steel itself. And as I said, no peeling or flaking.

Q. Then where's the miracle? We tried galvanized before. And it struck out. Too much trouble, too much cost fixing it up after fabrication.

A. No miracle. It's just that Weirkote's made by the continuous process which integrates zinc and steel so that the toughest fabrication won't break down the bond.

Q. That means then that Weirkote can eliminate the need for plating or dipping to assure uniform corrosion protection for the most intricate part . . . is that the picture?

A. Yes, that's exactly the picture . . . and besides, Weirkote is now treated to inhibit wet storage (white oxide) stain.

Send today for free booklet that details the time- and cost-saving advantages of using skintight zinc-coated Weirkote. Write Weirton Steel Company, Dept. A-8, Weirton, West Virginia.

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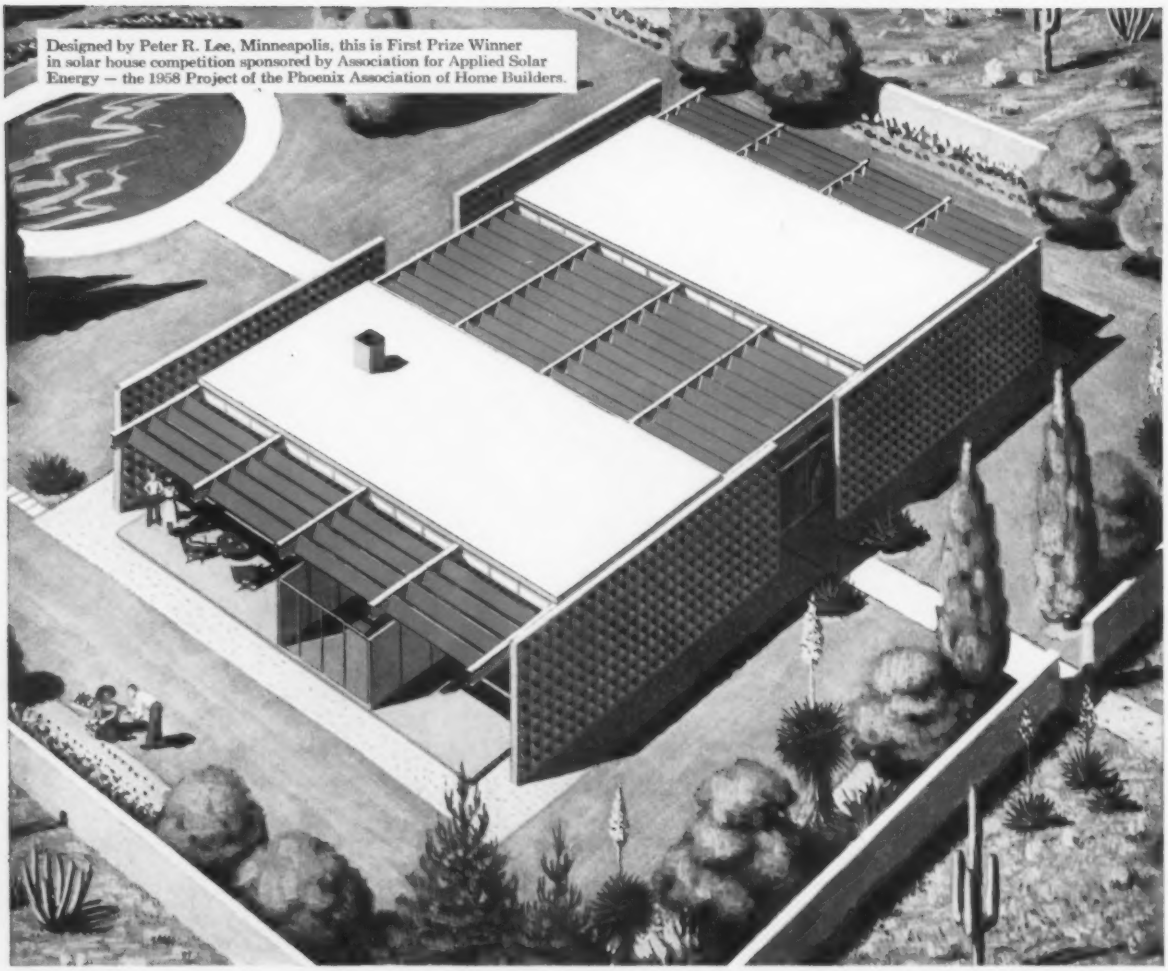


Designed by Peter R. Lee, Minneapolis, this is First Prize Winner in solar house competition sponsored by Association for Applied Solar Energy — the 1958 Project of the Phoenix Association of Home Builders.

Now—thanks to COPPER the sun can heat your home!

Solar scientists turned to Copper to help harness the power of the sun. They've been so successful, your home today, and perhaps *all* future homes in certain temperate climates, can be heated in this dramatic, efficient way.

Here's how solar energy is put to work: Blackened Copper "collectors" on the roof absorb heat from the rays of the sun. This heats water circulating in Copper tubes built into the collectors. And the heat is then transmitted throughout the house by conventional methods. To take care of cloudy spells, heat is stored in large, buried water tanks.

Two of Copper's outstanding characteristics are emphasized by this advanced heating method. First, it is an unexcelled commercial heat transfer agent. Second, its resistance to corrosion makes it ideal for water circulation systems.

In addition, Copper and its alloys are easy to work, form, join, draw, stamp, polish and plate. And Copper's efficiency as a practical electrical conductor is unmatched. Let Copper help solve your problems. The industry's reserves are now at a record high, productive capacity is greater than ever.

COPPER • BRASS • BRONZE

in over 40 Standard Alloys!

For information on other applications of Copper, write Copper & Brass Research Association, 420 Lexington Ave., New York 17, N. Y.

L. E. Spencer, elected executive vice president, Goodyear Tire & Rubber Co., Ltd. of Toronto, Canada; **M. W. Laibe,** appointed asst. to the president.

T. A. Low, elected vice president, marketing, Steel Warehousing Corp., Chicago; **F. G. Brydon,** appointed manager, sales; **P. B. Gallagher,** named manager, Stainless Steel Div.

E. H. Gott, appointed vice president, production, Steel Producing Divisions, U. S. Steel Corp.

John Miller and **W. F. Hommert,** elected vice presidents, Nooter Corp., St. Louis; **E. W. Smitt,** elected secretary; **H. H. Koch,** elected treasurer.

J. M. Knox, appointed executive vice president and treasurer, Research-Cottrell, Inc., Bound Brook, N. J.; **Dr. H. J. White,** elected secretary.

E. B. Speer, appointed general manager, operations—Steel, Production Dept., U. S. Steel Corp.

Oscar Pearson, appointed vice president, operations—steel, U. S. Steel Corp.

E. B. Nelson, named asst. vice president, coal-production, Production Dept., U. S. Steel Corp.; **W. G. Talman,** appointed asst. vice president, coal-staff.

A. I. Dranetz, appointed vice president, Gulton Industries, Inc., Metuchen, N. J.

D. L. Eynon, will become vice president and general manager, Plastics Div., Koppers Co., Inc., Pittsburgh; **T. C. Keeling, Jr.,** named vice president and general manager, Chemicals and Dyestuffs Div.

F. H. Conant, named general sales manager, Riverside-Alloy Metal Div., H. K. Porter Co., Inc.

Dr. F. G. Singleton, promoted to vice president, research, H. H. Robertson Co., Pittsburgh.

G. T. Underhill, elected vice president, sales, The Seymour Mfg. Co., Seymour, Conn.

C. L. Sadler, elected vice president, Sundstrand Aviation Div., Sundstrand Machine Tool Co., Rockford, Ill.; **R. H. Olson,** elected vice president, Sundstrand - Turbo Div.

Pat Cicala, named vice president, Waltham Precision Instrument Co., Waltham, Mass.

R. N. Campbell, elected vice president, Westinghouse Electric Corp. and president of C. A. Olsen Mfg. Co., Elyria, O., a subsidiary.

R. D. Allison, appointed general superintendent, Pittsburgh steel service plant, Joseph T. Ryerson & Son, Inc.

Waldo Porter, appointed production assistant, Smelting Div., Aluminum Co. of America, Pittsburgh.

M. C. Niepert, promoted to general foreman, Open Hearth Dept., Granite City Steel Co., Granite City, Ill.; **J. E. Goodin,** promoted to asst. superintendent, Open Hearth Dept.

Following appointments are within the Personnel Services Dept. of U. S. Steel Corp., Pittsburgh: **W. L.**

WORLDS
LARGEST
STOCK
52100
STEEL
Peterson
STEELS, INC.
Union, New Jersey • Detroit, Michigan • Melrose Park, Illinois

Lohrentz, named vice president—organization planning and compensation; **E. C. Myers,** named vice president—personnel; **J. W. Shaver,** named vice president—labor relations.

Dr. C. E. Arntzen, appointed manager, Materials Engineering Dept., Westinghouse Electric Corp.; **S. A. Rosecrans,** appointed asst. manager.

R. F. Armitage, appointed general superintendent, Warren, O., district, Republic Steel Corp.

J. L. Young, named vice president, appropriations, U. S. Steel Corp.

E. F. Greiwe, appointed manager, Norwood Works, Centrifugal Pump Dept., Allis-Chalmers Mfg. Co.

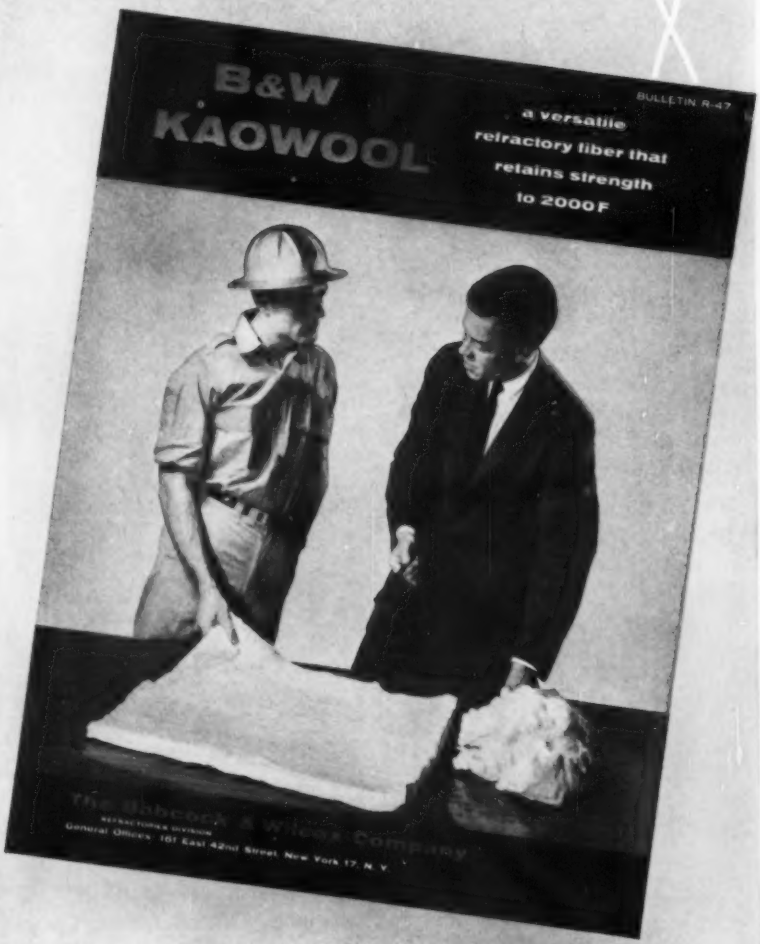
M. R. Duncan, appointed manager, product service and marketing administration, Technical Products Dept., General Electric Co., Syra-

New Bulletin on

B&W KAOWOOL

Gives data on many uses of 2000 F refractory ceramic fiber

B&W Kaowool, the 2000 F refractory fiber, is being successfully used for expansion joints in walls, roofs, around burners and in car tops of ferrous and non-ferrous heating furnaces. B&W Kaowool blankets are also serving as insulation in the pre-heating and stress relieving of large welded units. Write for new bulletin giving helpful data on B&W Kaowool, the multi-purpose ceramic fiber that withstands high temperature service.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a versatile refractory fiber that retains strength to 2000 F
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R6018

cuse, N. Y.; **J. M. Stevenson,** appointed sales manager, vacuum melted products, Metallurgical Products Dept., Detroit.

D. B. Foy, appointed field engineer, Norton Co., Worcester, Mass.

E. L. Tindall, named vice president, design and construction, U. S. Steel Corp.

Paul Galton, appointed manager, sales, Worthington Corp.'s Plainfield, N. J. Division.

A. V. Lorch, named marketing manager, pig and ingot, Kaiser Aluminum & Chemical Sales, Inc., Oakland, Calif.

W. F. S. Dowlding, appointed director, quality control, Long Mfg. Div., Borg-Warner Corp., Detroit.

A. S. Farrell, appointed production superintendent, Olin Aluminium division rolling mill, Olin Mathieson Chemical Corp.

H. E. Erf, appointed Chicago district sales manager, Sterling Grinding Wheel Co., Tiffin, O.

J. D. Rollins, named vice president, facilities planning, U. S. Steel Corp.

E. R. Huckman, appointed asst. field sales manager, The Foxboro Co., Foxboro, Mass.

C. C. Landegger, appointed asst. general manager, Paper Machine Div., Black-Clawson Co., Watertown, N. Y.

J. D. Kreager, promoted to sales manager, Abrasive Machine Div., Engelberg Huller Co., Inc.

E. B. Reynolds, named New York regional sales manager, Olin Aluminum, Olin Mathieson Chemical Corp.

R. M. Corcoran, appointed traffic manager, Eastern region, New York headquarters, Universal Atlas Cement Co., New York.

F. E. Holland, appointed asst. sales manager, Butterfield Divisions, Union Twist Drill Co., Derby Line, Vermont and Rock Island, Quebec;

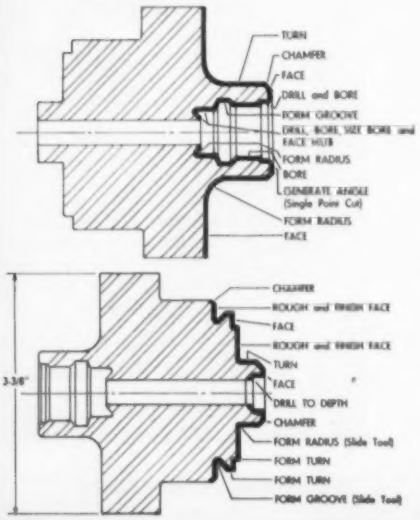
Let me show you*

* *George Marr,*
P&J Representative
Pawtucket, R.I.
Telephone PAwtucket 5-6500

how a change to our P&J Automatics helped American Bosch . . .

JOB FACTS:

PART: *Head for Diesel Engine Fuel Pump.*
MATERIAL: *Nitralloy G, 28-35 Rockwell C.*
REQUIRED: *25 separate turning, facing, boring and forming cuts, with most surfaces held to .0015".*
THE MACHINES: *2 P&J 3-U "Speed-Flex" Automatic Turret Lathes.*
THE RESULTS: *Part completed in 2 fully-automatic cycles. Floor-to-floor time 5.5 minutes!*

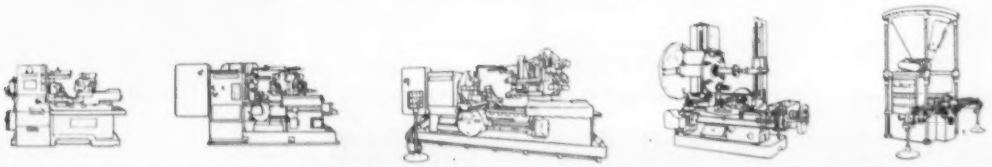


. . . . INCREASE PRODUCTION 45% AND REDUCE MAN-MACHINE HOURS 75%!

American Bosch Arma Corporation, one of the leading producers of automotive, electrical and diesel injection equipment, was using hand turret lathes to machine close-tolerance fuel pump heads. Two of these lathes – each with an operator – were working two 8-hour shifts per day, and a plant-wide survey showed that machining time and costs were too high. Called in to analyze the problem, we recommended two of our P&J 3-U "Speed-Flex" Automatics, with *both* machines to be operated by *one* man on a single 8-hour shift per day.

On the job 18 months, this installation has practically paid for itself in labor savings alone. Now, when the operator receives the workpiece, he chucks it in the first machine, and 12 cuts are completed in a single fully-automatic cycle. He then chucks the part in the second machine, and the remaining 13 cuts are completed. Floor-to-floor time is just 5.5 minutes . . . a 45% reduction over the old method. And 3 machinists have been released for other work.

If your manufacturing operations involve high-speed parts production, a switch from hand machines to P&J Automatics can also bring important benefits to you. Act today. Ask the P&J Representative in your area to analyze your requirements and recommend a production plan that meets your specific needs. If you prefer, write direct to Potter & Johnston Company, Pawtucket, Rhode Island.



AUTOMATIC TURRET LATHES . GEAR CUTTERS . . PACKAGING MACHINES

POTTER & JOHNSTON

SUBSIDIARY OF PRATT & WHITNEY COMPANY, INC.

PRECISION PRODUCTION TOOLING SINCE 1898

E. J. Bushey, appointed asst, works manager, Athol, Mass. Division.

G. H. Dennison, appointed general manager, sales, Keystone Abrasive Wheel Co., Carnegie, Pa.

Clarence Dykstra, appointed sales manager, Spanmaster Crane Div., Jervis B. Webb Co., Detroit.

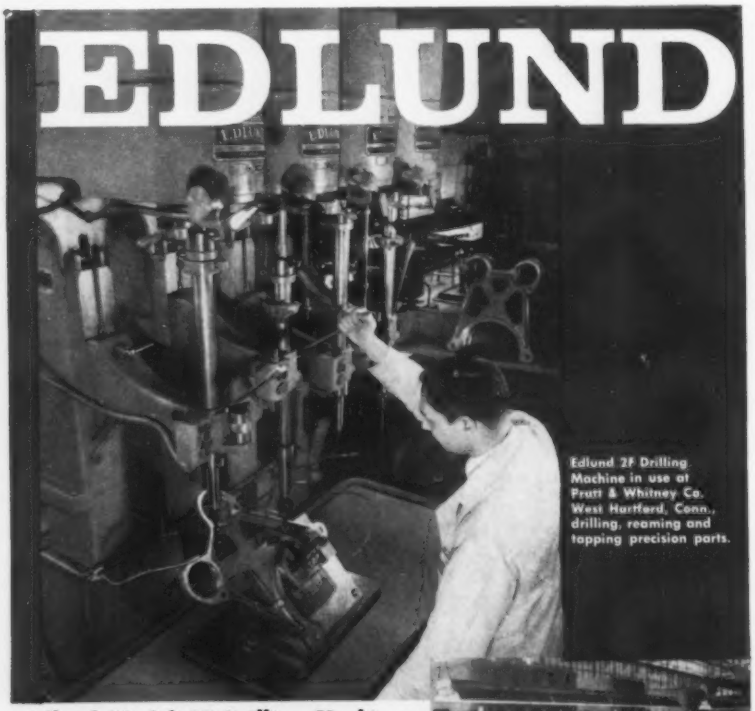
W. E. Bechtel, appointed production superintendent, McKinney Mfg. Co.

E. K. Von Fange, named engineer, valve control research, General Electric's Manufacturing Services, Schenectady, N. Y.

H. A. Keefe, appointed southern and southeastern representative, stainless steel and nickel chrome alloy scrap, H. Klaff & Co., Inc., Baltimore.

V. T. Wray, appointed manager, Chrysler Corp.'s McGraw Stamping plant, Detroit.

EDLUND



Edlund 2F Drilling Machine in use at Pratt & Whitney Co. West Hartford, Conn., drilling, reaming and tapping precision parts.

Edlund Model 2F Drilling Machines at

PRATT & WHITNEY

Pratt & Whitney, famous manufacturer of machine tools – Jig Borers, Keller Machines, Gages and Cutting Tools, uses Edlund Drilling Machines to assist in the production of precision parts.

Modern features —
Flexibility of infinitely variable speeds • Rugged construction for sustained accuracy typical of Edlund; • No Loss of Production Time Changing Belts or Gears.

For complete information and specifications about Edlund Model 2F Drilling Machines for your jobs, write for Bulletin 140R.

Production Line of Edlund 2F Drilling Machines at Pratt & Whitney featuring—
Power Table Lift
Extra Spindle Travel
Reversing Motor Tapper

EDLUND REPRESENTATIVES IN MAJOR CITIES

EDLUND MACHINERY COMPANY
Cortland, New York
Division of Harsco Corporation

R. C. Snell, appointed asst. manager, building sales, Stran - Steel Corp., Detroit.

C. N. Simpson, appointed Detroit district manager, Union Twist Drill Co.

K. L. Johannsen, appointed general superintendent, Central Operations, Fairless Works, U. S. Steel Corp., Morrisville, Pa.

Neil Robertson, appointed acting general traffic manager, Manufacturing Dept., The Babcock Co.'s Boiler Div., Barberton, O.

N. S. Bassett, appointed sales manager, Davies Laboratories Div., Minneapolis - Honeywell Regulator Co.

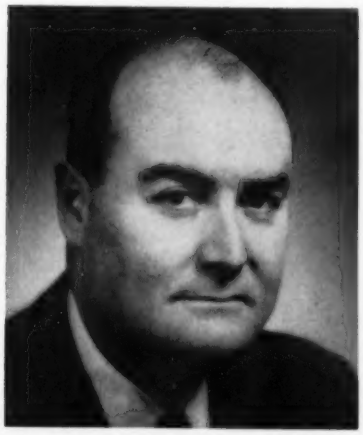
R. J. Kenard, Jr., named sales representative, Los Angeles, Selas Corp. of America, Dresher, Pa.

George Kerr, appointed sales engineer, The Pusey & Jones Corp., Wilmington, Del.

R. T. Sheppard, appointed sales

and engineering representative, Kentucky, Illinois and Indiana area, Michigan Tool Co.

J. J. Taylor, appointed asst. chief engineer, Industrial Heating Equipment Co., Detroit.



A. J. Mackan, appointed Cleveland district sales manager, Federated Metals Div., American Smelting & Refining Co.

K. C. Allen, promoted to supervisor, research and analysis, Commercial Research Div., Jones & Laughlin Steel Corp., Pittsburgh.

Frank McBride, promoted to district sales manager, Cleveland, Industrial Brownhoist Corp., Bay City, Mich.

C. E. Lacy, appointed manager, Engineering Dept., Hardinge Co., Inc., York, Pa.

Walter Poremba, promoted to sales manager, Alloy Precision Castings Co., Cleveland; **Michael Gladstone,** named general manager.

C. C. Benedict, appointed comptroller, Chrysler Div. and **D. A. Milton,** named comptroller, Stamping Div., Chrysler Corp., Detroit.

T. A. Halpern, appointed sales manager, Asheville, N. C. plant, International Resistance Co., Philadelphia.

R. G. Worth, appointed specialist, cutting tool distributor sales, Metallurgical Products Dept., General Electric Co., Detroit.

W. O. English, appointed divisional manager, Flange and Forging Div., Phoenix Mfg. Co., Catasauqua, Pa.

Charles McKenna, appointed sales representative, Leschen Wire Rope Div., H. K. Porter Co., Inc., St. Louis.

W. L. Stover, appointed asst. chief engineer, Mesta Machine Co., Pittsburgh.

Ray Neff, appointed Southern Florida sales representative, Latrobe Steel Co., Latrobe, Pa.

E. W. Rearwin, named die casting engineer, Reed-Prentice Div., Package Machinery Co., Worcester, Mass.

W. F. Eagan, appointed chief engineer, Control Dept., Allis-Chalmers Mfg. Co.

C. A. Cherry, named steel sales representative, Buffalo area, A. M. Byers Co., Pittsburgh.

A. D. McDade, appointed chief engineer, A. A. Straub Co., Inc., Cleveland.

C. E. Peters, appointed plant manager, Beatty Machine & Mfg. Co., Hammond, Ind.

V. T. Nolan, appointed purchasing agent, Alloy Tube Div., The Carpenter Steel Co., Union, N. J.

J. B. Hite, named service engineer, Pittsburgh district, Kennametal Inc.

E. A. Rogers, appointed field engineer, Chicago district office, Norton Co., Worcester, Mass.

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ROLLS
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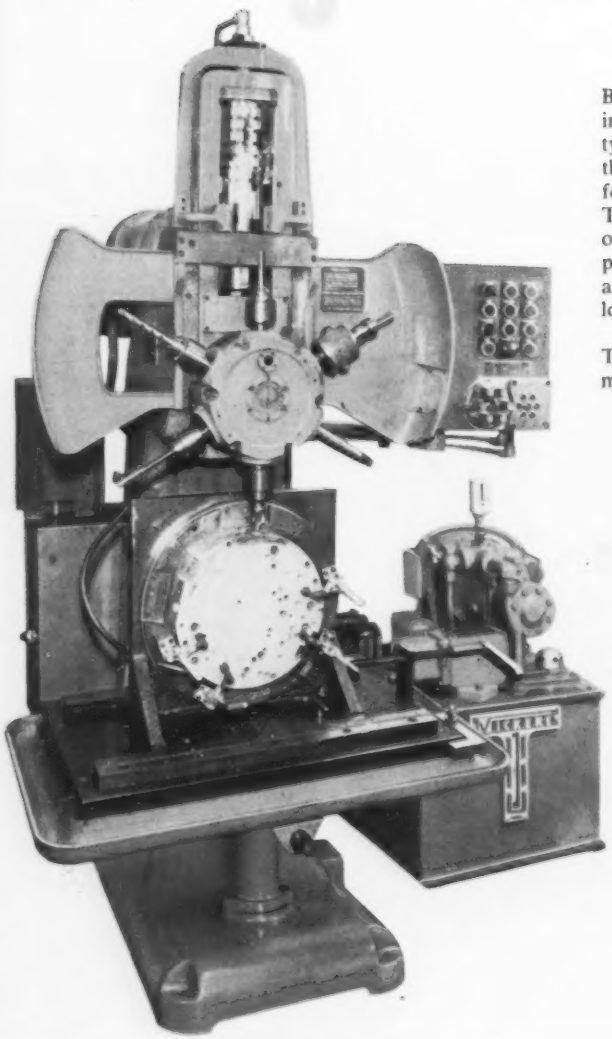
Former Time 1.94 Hrs./Pc.

Present Time .77 Hrs./Pc.

with Burgmaster Automatic



Burgmaster Model 2BH Automatic Hydraulic Turret Drills are increasing production, improving quality, and cutting costs on all types of jobs. At BENDIX-PACIFIC, North Hollywood, California, they are reducing machining time 60% on missile parts which were formerly machined on conventional drilling and tapping machines. Twenty-seven valve ports are machined in three manifold sections on three machines, a total of 46 operations which use four tools per operation. (Finish is critical, demanding no tool marks in some areas.) Average rate of production is 35 parts per hour, and scrap loss is reduced to a minimum.

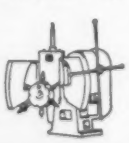
Automatic Hydraulic operation assures quality and economy. This production record is made possible by the efficient automatic machine functions of the Burgmaster Model 2BH Turret Drill. The

The girl holding a plastic model of one of the manifold sections. Note the extensive machine work required.

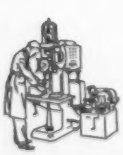
Specialists in High Production Turret Drilling

1C Manual Power Index 3/8" Capacity

2B Manual Power Index 3/4" Capacity

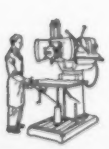


2BF Flange Mounted Power Index 3/4" Capacity



2BH Automatic Hydraulic 3/4" Capacity

3BH Automatic Hydraulic 1½" Capacity



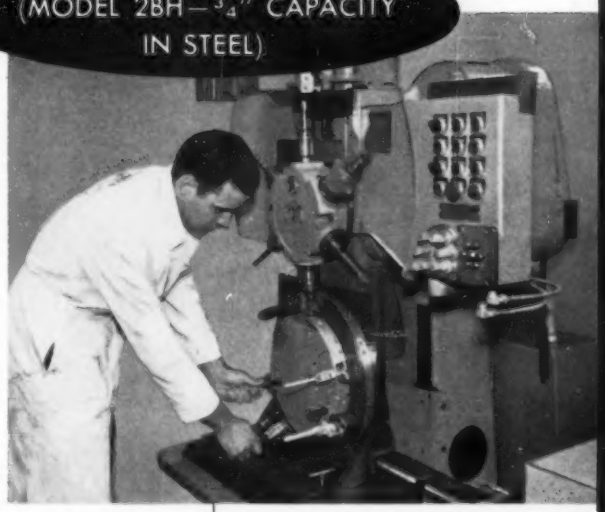
2BR Ram Type Radial Drill 3/4" Capacity

2BHT-3BHT Automatic Tape Controlled 3/4" and 1½" Capacity

at BENDIX-PACIFIC, NORTH HOLLYWOOD, CALIFORNIA

Hydraulic 6spindle Turret Drill

(MODEL 2BH—$^{3}/_{4}$" CAPACITY IN STEEL)



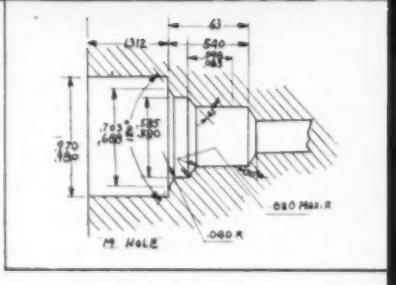
turret is power indexed, speeds are pre-selected for each turret face, and pre-selective infinitely variable, constant hydraulic feeds assure fine finish and accuracy. In addition accurate depth control for each turret face is provided, and the automatic hydraulic rapid approach and return saves valuable machine time. All operations of a machining cycle are performed at the most efficient rate commensurate with fine finish, accuracy, speed, and longest tool life. The parts are held in quick clamping indexing fixtures which are provided with positive pin locators.

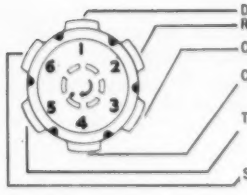
Burgmaster may be supplied as complete production units including fixtures and tools ready to go into production. Why not ask a Burgmaster field engineer to call and get his suggestions on your work. There is no obligation.

Job Facts

Machine—Burgmaster 2BH Automatic Hydraulic Turret Drill
Part—Manifold Plate (3 levels) M Hole (Typical)
Lot—100
Material—Magnesium
Holding—Special Indexing Fixture—Pin located
Finish—Critical—No Tool Marks some areas
Former Method—Conventional Drilling and Tapping Machines
Former Time—1.94 Hrs./Pc. overall time
Burgmaster Time—.77 Hr./Pc. overall time
Savings—1.17 Hrs. or 60%

Close-up showing the special hand indexing fixtures that accurately locate and hold the manifold section for machining the valve ports. Separate fixtures are required for each of the three sections. Photo shows machining type M hole.





Operation	Dimensions M Hole	Feed	Speed
Drill	.495/.490 x 1.975/1.915	.004	1200
Ream	.509/.508 x 1.975/1.915 Deep	.004	450
C'Bore	.980/.970 dia. x 1.322/1.302 deep	.004	300
C'Bore	.585 x .580 x .098/.093 from BTM of .980/.970 dia. Finish 45° & 120° angles	.004	450
Tap	9/16–18 UNF 3B x .540 THD		150

Write for bulletin describing Burgmaster 6 and 8 spindle Automatic Hydraulic Turret Drills in detail. Twenty-minute 16mm sound film showing Burgmaster turret drills in operation, including the new automatic positioning table, available from any office.

Dept. 3

BURG TOOL

MANUFACTURING COMPANY, INC.

15001 South Figueroa Street, Gardena, California
FAculty 1-3510 DAvis 9-4158

BURGMASTER DIRECT SALES OFFICES:

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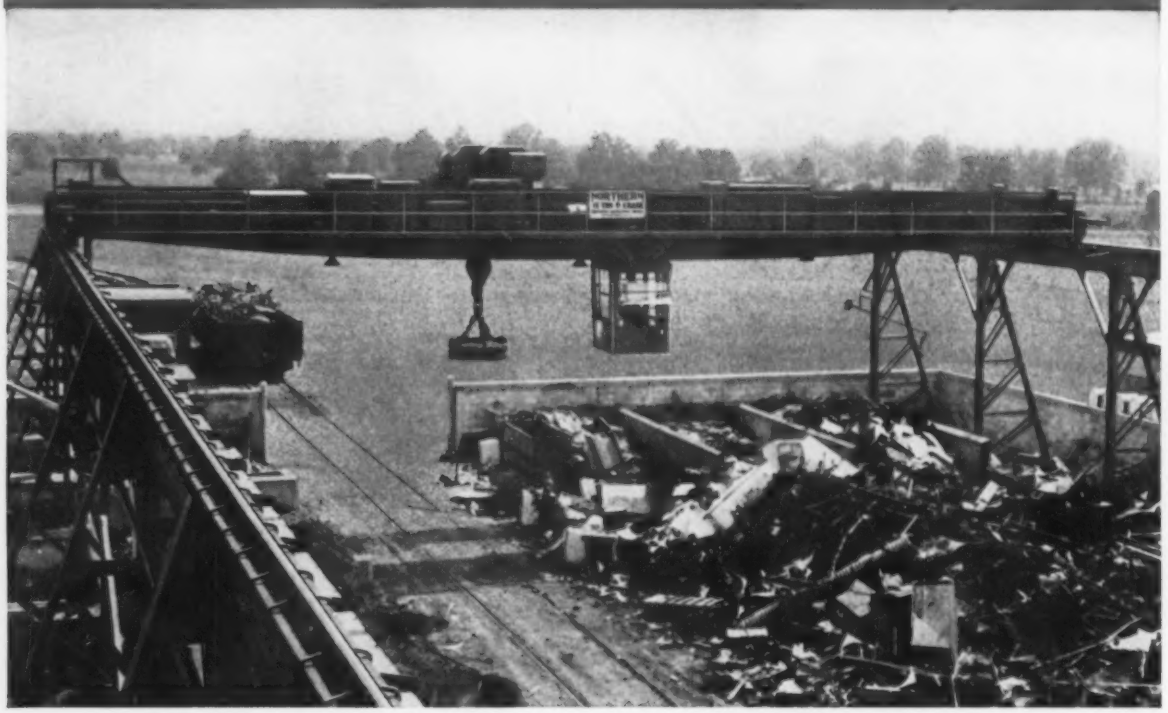
Plus dealer representatives in other industrial centers.

Look Overhead··· see "NORTHERN"



one NORTHERN crane serves many plants

LOCATION

The salvage yard of a group of individual plants manufacturing household appliances.

SPAN

80 feet, centers of runways.

CAPACITY

15 tons, magnet handling.

ELECTRICAL EQUIPMENT

A. C., full magnetic, counter torque lowering with motor generator set mounted on crane footwalk.

This NORTHERN magnet handling yard crane is solely responsible for handling all salvage materials resulting from operations of a group of adjacently located, highly automated plants, each of which manufactures a different product line of household appliances.

NORTHERN CRANES—in this and many other similar installations—assure:

(1) the advantages of higher operating speeds to handle turnover faster in relation to yard space;

(2) dependable, continuous operation with minimum downtime for service and maintenance because of their heaviest duty type bearings, gears, end trucks and electrical equipment;

(3) safer, faster, more effective load handling because the operator has better visibility from the Northern Clear Vision Control Cab;

(4) lower cost operation because oil bath lubrication eliminates need for daily lubrication, minimizes crane idle time, causes fewer parts to wear out, fail, or need replacement.

Let us explore improvement in your salvage material handling.

NORTHERN MATERIAL HANDLING EQUIPMENT

NORTHERN ENGINEERING WORKS

210 CHENE ST. • DETROIT 7, MICH.

EVERYTHING CHECKS: Explorer nose cone is measured carefully at every step of the cold forming process.

"Explorer" Nose Cold Formed From 430 Stainless

A piece of auto-trim grade stainless steel is riding serenely through space at this moment.

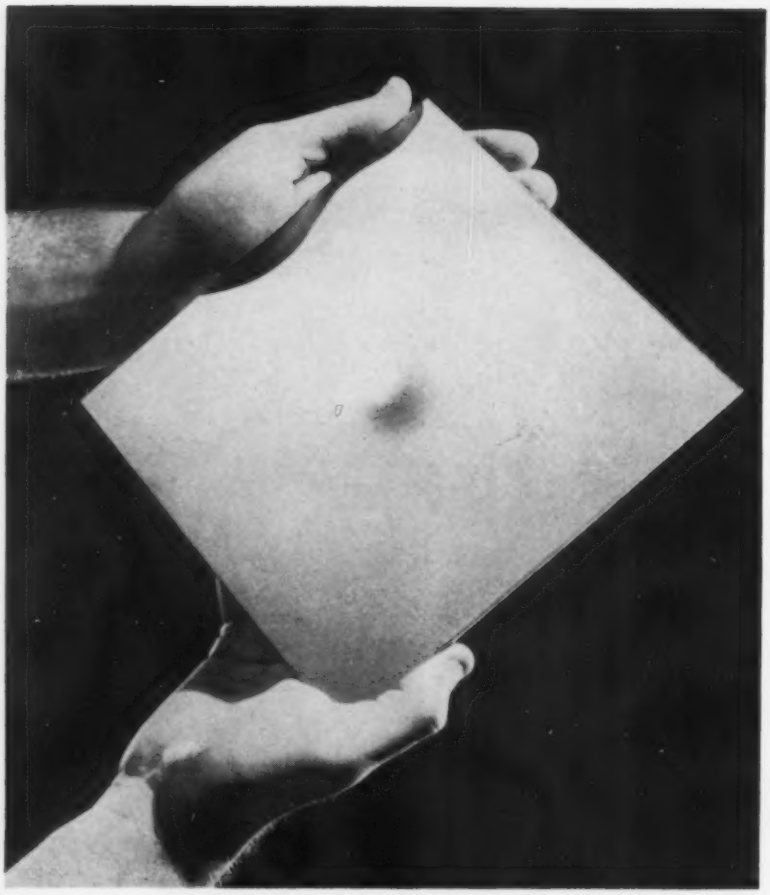
It's the nose cone for the Army's Explorer satellite. Here's how it was produced for its fantastic journey.

▪ Hurtling through outer space at 18,470 mph is a 13-oz piece of stainless steel, the nose cone of Explorer I, The U. S. Army's earth satellite. At one point this bit of metal might easily have become a part of the shiny trim on your new car; type 430 is an alloy automobile makers often use for such purposes.

But this particular piece was destined for use on a space vehicle, and for a ride on uncharted cosmic highways. Launched on January 31 at Cape Canaveral, Fla., the Army's instrument laden satellite is still circling the globe on schedule; one complete circuit every 115 minutes.

One Foot Long—Explorer I's blunt-nosed cone is 12 in. long and 6 in. in diam at its base. Its skin thickness ranges from 0.013 to 0.017 in., and the metal at the center of the nose itself is 0.094 in. thick. It's a seamless piece, having been cold formed from a single square of sheet material. The only discontinuities in its surface are 16 equally spaced holes, each 0.125 in. diam which were drilled at the base for fastening the cone to the satellite's instrument package.

Cold forming of the cone was done by the Lodge & Shipley Co., Cincinnati, on stainless sheet supplied by Republic Steel Corp. Using the Floturn cold roll-forming technique which it developed, the Cincinnati firm actually produced 40 nose cones in all on a contract from



LOCATING POINT: Blank of 430 stainless must be dimpled for proper location on forming mandrel to start Floturning operation.

the Army's Ballistic Missile Agency and the Jet Propulsion Laboratory of the Calif. Institute of Technology.

Takes Mandrel Form—Floturning is basically a cold rolling process. Heavy pressure applied to a roller-type tool literally flows a metal blank to the shape of a mandrel as workpiece and mandrel both revolve.

The extreme degree of cold work induced by the process has a marked beneficial effect on the workpiece. Its grain structure is compressed and refined; yet the lines of grain flow remain unbroken. Thus considerable strength and hardness is imparted to the finished piece.

Parts formed in this way also have a minimum of internal stresses. Those that are present are uniform; moreover, they can be completely relieved by an annealing treatment. Surface finish of Floturned parts is excellent also. The smooth roller tool usually smooths out the finish to a 4 or 5 microinch average.

Three Basic Steps—Explorer I's cone was formed in three basic steps. First a square-shaped blank, 0.093 in. thick, was dimpled at its center. The dimple served as a locating surface for the mandrel in the first Floturning operation.

Step No. 2 was an initial roll forming on the dimpled blank to produce a partial cone configuration. After partial forming to a predetermined point, the workpiece was annealed to relieve stresses. Step No. 3 was the final cold roll-forming operation, after which the base was trimmed to its prescribed 6 in. diam. Final inspection of wall thickness was made on an ultrasonic gage.

Stainless Deemed Best—Stainless steel was specified for the nose cone because of its high tensile strength and its resistance to temperature extremes, even in the thin sections required for the 29.7 lb Explorer. However, the satellite package was "temperature engineered" still further to reduce the effects of the very low and very high temperatures it encounters as it circles the Earth.

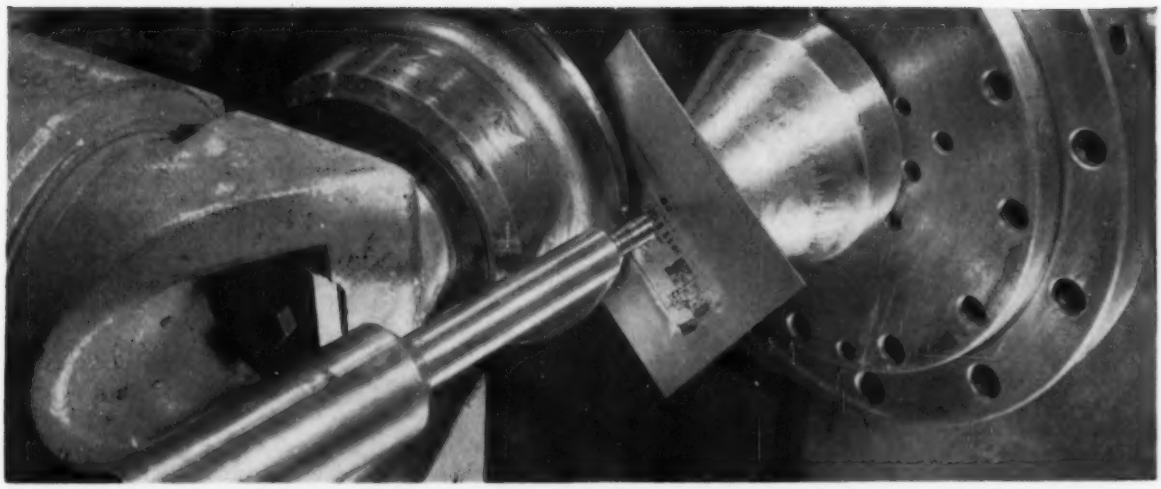
When it is in the Earth's shadow, Explorer radiates heat to the coldness of empty space. When it is in blistering sunlight it absorbs heat at a terrific rate. The temperature differential is about 800°F, ranging from about 150°F below zero on the cold side to nearly 600°F on the sunny side.

Ceramic Guards Instruments—Scientists controlled these temperature extremes by coating parts of the instrument package and nose cone outer surfaces with sprayed-on stripes of a ceramic material developed by the Norton Co. As these stripes of refractory material spin in space they reflect a high degree of radiation.

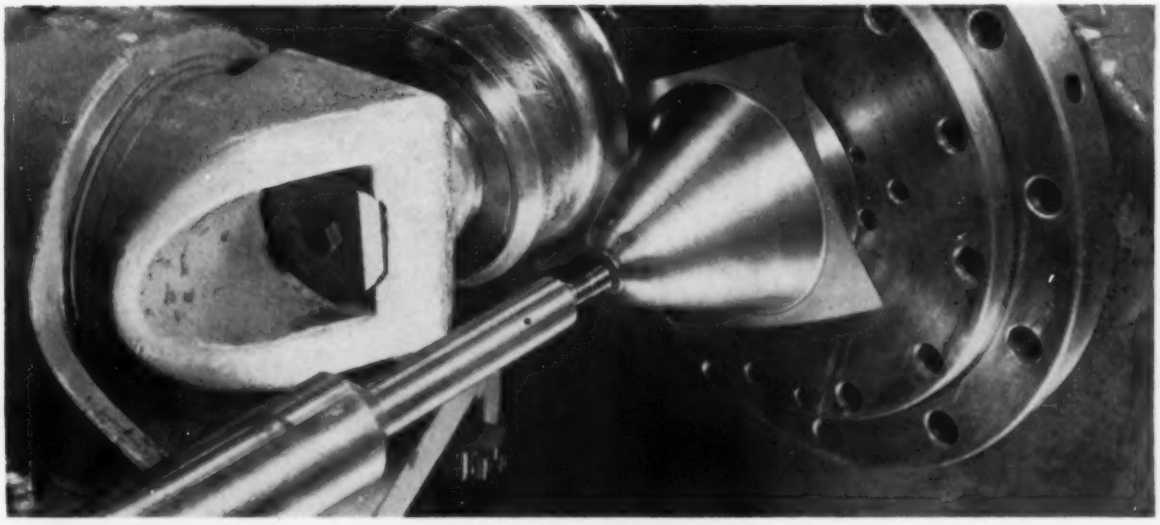
As a result, temperatures inside the satellite range between 50°F and 86°F. This protects the sensitive instruments and electronic components which record and transmit valuable information to a host of receiving points on the Earth below.

Satellite temperatures are reported by tiny bead-shaped thermistors whose resistance to the flow of electric current changes with environmental temperatures. The nose cone carries a thermistor temperature probe to detect any and all thermal variations.

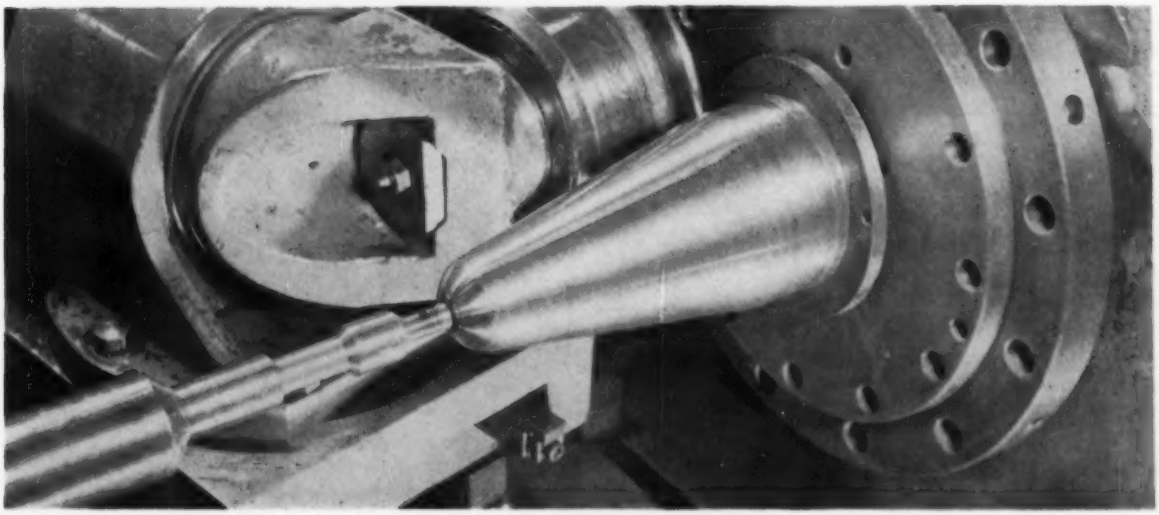
Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39. Pa.



FIRST STEP: Dimpled blank of stainless sheet, 0.093 in. thick, is clamped against end of mandrel.



TIME FOR ANNEAL: At this stage of first forming operation, workpiece must be removed for an anneal.



ALMOST DONE: Explorer nose cone is 85 pct complete. When finished, excess metal will be trimmed at the base.

Ultrathin Oxide Films Aid Research

It's hard enough to even visualize an oxide film only 50 molecules thick, let alone to actually separate one from a sheet of aluminum foil.

Yet, researchers have worked out a way to do it, and on a variety of materials.

▪ Self-supporting aluminum oxide films only one-millionth of an inch thick and 2 in. or more in diameter: scientists at Westinghouse Research Laboratories are making them as a matter of routine by chemically dissolving away aluminum foil and saving the thin oxide film which coats it.

The film is used to support layers of sensitive material in electronic imaging tubes. Because of its extreme thinness, electrons traveling through the tube can penetrate the sensitive layers without being interrupted by a supporting structure. To work at all, the film has to be extremely thin; it must also be large enough to serve as a miniature screen within the tube.

Use Household Foil — Despite their delicacy, the films are quite easily made. First, a piece of aluminum foil, free of wrinkles, is pressed flat. The aluminum oxide coating on one side is removed to expose the metal underneath.

The foil is then washed in distilled water, dried, and placed in an acid solution. The acid eats away all the metal, leaving only the thin coating of oxide on the other side. This film is washed, dried and mounted on a round metal ring.

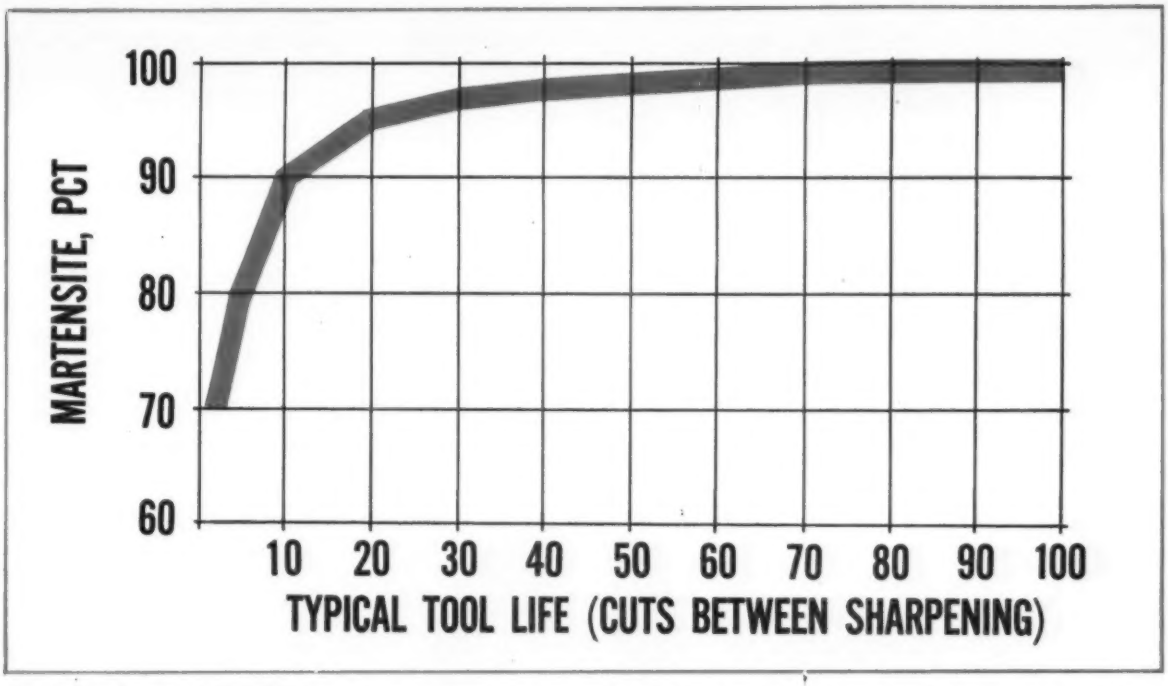
Since the ordinary oxide coating on aluminum foil is usually too thin, Westinghouse scientists may first build up the coating by electrodeposition of additional oxide.

Westinghouse estimates its aluminum oxide films are only 25 to 50 molecules thick. They are almost perfectly transparent and colorless. Yet, for their thickness, the films have tremendous strength; they support themselves over relatively large surface areas and withstand fairly large external forces during preparation and normal handling.

Another feature is their unusual uniformity. Measurements show that a film may vary in thickness over its entire surface by not more than a single molecule.

Westinghouse reports equal success in making films of many other materials, including various metals and their oxides. Besides being useful in electronic devices, the films can be used in research on the basic properties of matter.

TWO-D SOLID: Oxide film appears transparent because its thickness is only about 1/20 the wave length of light passing through it.



EFFECT OF MARTENSITE: Increasing martensite content along with a corresponding decrease in austenite makes for more cuts per grind. Tool life goes up sharply when martensite content is above 90 pct.

Alter Tool Structure for Longer Life

By **Herbert Chase**—Consultant, Forest Hills, N. Y.

Recent studies indicate that useful life of a high speed steel tool is related to the amount of retained austenite.

The more of it that's transformed to martensite, the longer the tool will last.

A new type of treatment is reported to effect a high degree of transformation, all the way through the tool.

■ Despite the growth of carbides and ceramics, high-speed steel tools keep right on finding wide use. A continuing problem, however, is their life per grind. Many shops use surface treatments, but these are temporary and must be repeated after each grind.

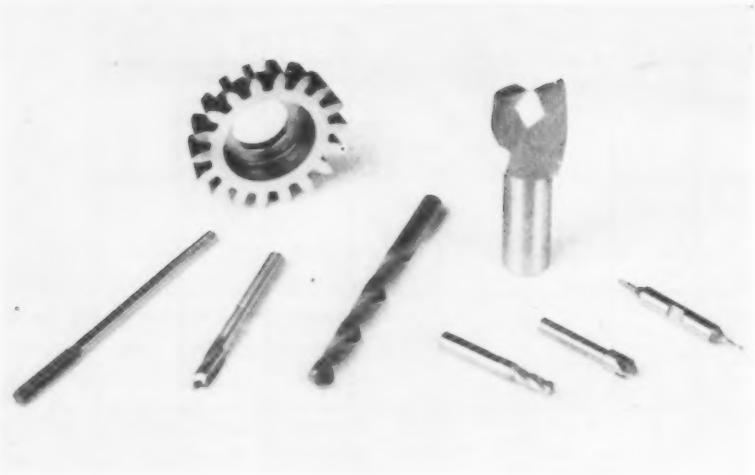
To improve this situation, Scandia Tool Co., Newark, N. J., launched a program of basic research into factors affecting tool life. Out of it has come a new technique for increasing life of nearly all high-speed steel tools having sections ⅛ in. or more in thickness. Here is a summary of results reported by Scandia:

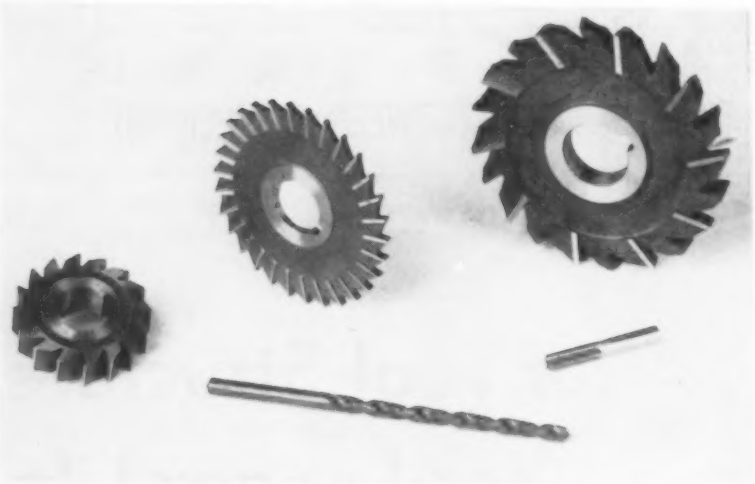
A number of high-speed steel cutting tools contain 11 to 15 pct or more of austenite. This applies even to some triple-tempered tools, including high cobalt forms such as T-4, T-5, T-6, T-8, T-15, M-6, M-20, M-30, M-34, M-36, and M-40. The more complex the alloy the harder it is to decrease austenite.

Marked Effect—Austenite materially shortens the time between grinds and reduces tool life. It's not a straight-line relation, but as martensite approaches 100 pct and austenite content moves towards zero, there is a rapid increase in the number of cuts per grind.

From zero to about 85 pct martensite, the gain in tool life is relatively small. It increases more rapidly from 85 to 90 pct. This is a common range for high-speed steel tools.

But the curve shows that a still faster increase in tool life is attained by converting austenite to martensite above 90 pct. Scandia directed its research toward pro-





TREATED TOOLS: Typical of the tools being treated are these milling cutters, drills, reamers, gear cutters and end mills. In some cases useful life is four times greater than that of untreated tools.

ducing this gain on a commercial basis.

Complete Penetration — Called "Vitalizing," Scandia's process produces 100 pct martensite throughout the whole section of the tool. After treatment the tool makes from 75 to 400 pct more cuts per grind and can be reground until completely used up. Since stock removed per grind is no more than for untreated tools, tool life increases the same amount.

Hundreds of shop tests, employing a variety of Vitalized high-speed steel tools, have confirmed the expected increases. On reamers, milling cutters and end mills, life has been lengthened from 100 to 500 pct or more.

With these results, Scandia is able to guarantee at least 30 to 40 pct longer tool life.

Thin Pieces are Tricky — Very few treated tools wind up with less than a 30 pct increase; this occurs only where there is no austenite left for conversion to martensite. Such a condition is found almost entirely in tools having ⅛-in. or thinner sections. These lose heat so rapidly when quenched that there's no time for austenite to be retained and only martensite remains.

Since the Vitalizing treatment converts austenite to martensite, it's not effective on tools having no austenite. Thus Scandia doesn't apply its treatment commercially to tools having sections below ¼ in., although many having ¼ to ⅛ in. sections have been treated with life increase well above 40 pct.

Vitalizing is an electronic process employing a chemical bath. Ultra-high frequency current with varying resistances converts nearly 100 pct of the austenite to martensite. In addition to high-speed steels, it also works on air-hardening steels, high carbon, high chrome steels, and oil hardening steels, with about equal life increase for each type. The process isn't related to deep freezing.

Going to Thicker Sections — In early tests with Vitalizing, a piece 1-in. diam and ⅜-in. thick was the largest that could be treated successfully. Now, after five years of experimenting, pieces up to 20 in. diam and 30 in. long can be treated. Tests now in progress indicate that equal benefits may soon result on pieces 30 to 40 in. diam and over 60 in. long.

High-speed steel tools undergo no change in size when Vitalized. High carbon-high chromium tools and those of oil hardening and water hardening steel increase in size about 0.003 in. per in., or 0.3 pct. For this reason, finish ground tools of the latter type are not accepted for Vitalizing.

Treatment is feasible on tools that can be permitted to grow, provided they're only rough ground and are to be finish ground later. Such tools then remain stable in size throughout their life; they'll also resist heat checking and cracking during grinding to a far greater extent than untreated tools.

Carburized steels that have been pack hardened can be successfully Vitalized without size change, but hardness will increase 4 to 10 Rc. As no significant heating occurs in processing, the core remains soft.

On carburized gears of SAE 2512 steel, Vitalizing increases hardness from 57 to 64 or 66 Rc.

Oil hardening punches have been increased from 58 to 62 Rc.

Improves Ductility — Although Vitalizing increases hardness and wear resistance, it doesn't make the tool more brittle. On the contrary, ductility and shock resistance are notably increased. Vitalizing has also increased the life of oil hardening dies, subject to shock, 3.5 to 5 times.

Job shops sometimes disclaim interest in increased tool life on the ground that tools aren't used up before short runs are completed. But most tools require grinding even during short runs.

Moreover, standard tools such as milling cutters, reamers, counterbores, gear cutters, and others used repeatedly on many jobs, receive the same hard use as in long-run shops and involve high grinding costs. When tool life is increased by Vitalizing, the total yearly grinding bill may be cut to one third, besides savings in machine down-time.

Saves Time—Gear manufacturers have found Vitalizing of special benefit — not only through increased cutter life and reduced down-time, but also in terms of less paper work and fewer grinds.

Although Vitalizing was developed to increase the life of high-speed steels, the process is effective on carbon steels as well. It gives about equal increases in tool life, and is used chiefly on dies for blanking and drawing. Other carbon steel tools that have been treated include 20-ft long saw bands used to cut aluminum. Life of the blades was increased from 8 to 32 hours.

TABLE I

Effect of Treatment on Various Tools

Size (in.) and Type of Tool	Material Cut	Average Number of Pieces per Grind		Number of Times Tool was Sharpened*	Application
		Before Vitalizing	After Vitalizing		
6 x 1 x 1¼ Stag sidemill	AMS 6260	25	78	8	Pump gears
5 x 1½ x 1½ Form relief cutter	B-1112	9000	21,500	11	Job shop tools
½ diam. Double-lip end mill	Vitalloy "N" steel	12	37	6	Pump gears and universal couplings
⅜ diam. Single-lip EM, full radius	403 stainless	2	5	repeatedly	Aircraft engines and electrical products
⅜ diam. Single flute double-end cutter	die steel	3 to 5 days	3 weeks	repeatedly	Aircraft engines and electrical products
0.376 to 0.5015 Step reamer	sintered iron	300–1100	4060	repeatedly	Cutting tools
2 diam. Twist drill	ANS 6260	30	75	25	Pump gears
5 DP, 20° EX PA Fellows gear shaper cutter	4645 steel	2 (0.030 in. wear on cutter)	3 (0.015 in. wear on cutter)	not stated	Gears
⅜ x 24 thd. Geometric thread chasers	SAE 4140	500	2200	15	Screw machine products
Single-point No. 8 Acme thread cutter	mild steel seamless tubing	1	8	repeatedly	Textile machinery and iron products
4¾ x 16 thd. Geometric thread chaser	bronze casting	50	125	not yet resharpened	General machine products
Form tool 2¼ diam. x 0.200	SAE 1144 steel	450	1200 to 1473	repeatedly	Job shop tools
Single lip end mill	die steel	3	8	repeatedly	Turbines and electrical products
⅜ diam. single-lip end mill, full radius	403 stainless steel	2	5	repeatedly	Turbines and electrical products
Spiral flute machine reamer 1¼ - 10 flutes	SAE 6140 steel	11	22	1	Mold bases

* Note: In all cases reported, there was no change in smoothness of cut produced before and after Vitalizing.

Survey Hot-Work Tool Steels For Aircraft and Missiles

Part 2

By R. J. Nekervis, C. H. Lund and A. M. Hall—Battelle Memorial Institute, Columbus, O.

Granting that hot-work tool steels have many metallurgical advantages, how are they likely to work out in production? Can they be welded? How do they machine?

Here is a rundown of the actual experience of users in the aircraft and missile industry.

▪ Hot-work tool steels have aroused considerable interest in the airframe industry because of the extremely high strengths they achieve both at room and elevated temperatures. This interest is heightened by the fact that these steels resist softening at high temperatures. Because they are air hardening, they warp less severely in heat treatment than do oil-quenching grades.

These are some of their distinct metallurgical advantages. But what are their fabricating characteristics? How readily do they lend themselves to the various production techniques?

Welding Requirements — Procedures for welding hot-work die steels are not simple because preheats and postheats are required. In this respect, they differ little from many other highly hardenable steels.

Of special interest is the first-hand experience of some users. Convair finds the hot-work tool steels somewhat more difficult to weld than AISI 4340. North American Aviation has noted that weldments of hot-work die steels are brittle unless preheated and postheated. Company personnel are currently familiarizing themselves with welding procedures for these steels.

Such subcontractors as Solar, Ryan, and Rohr anticipate no welding problems they cannot solve. Their attitude stems from their familiarity with a wide variety of steels and other constructional alloys.

Resisting Corrosion — North American successfully metal-arc welds hot-work tool steels in sheet form. In this work, 96 pct joint efficiency in heat treated weldments with an elongation of 6 pct has been obtained.

Most consumers consider the corrosion resistance of hot-work tool steels inadequate for many applications — even atmospheric exposure at room temperature. Therefore, this type of steel is not being considered or used for exterior applications such as skins.

The problem of corrosion in storage also arises. But this can be readily overcome by applying a coating of cadmium to the steel by means of vacuum deposition. This technique avoids possible hydrogen embrittlement.

Coatings Help—Effort has been made by the consumers to overcome the corrosion problem by application of various coatings. North American coats hot-work steels with a heat-resistant enamel, said to be useful up to the 800°-900°F range. In this case, the only plating done on this type of steel is the chromium plating of bearing surfaces. Organic coatings are also being studied for protective purposes.

Solar Aircraft has developed a number of coatings for steels. One is a ceramic coating that can be fired at tempering temperatures (1000°-1200°F). Solar uses it on 17-22AS and has applied it successfully to Thermold J.

The company claims this coating is not subject to pinholing when applied to medium- and high-carbon steel, and has excellent resistance to mechanical and thermal shock. They are now working on coatings that can be fired at annealing temperatures. They are also developing an aluminum coating carried in a flux vehicle, to be applied at 1300°-1350°F.

More Hydrogen—Little is known about the susceptibility of hot-work tool steels to hydrogen embrittlement. The general view taken is that such steels probably are prone to hydrogen embrittlement. This means precautions should be taken against the occurrence of such embrittlement. This attitude is taken by a number of airframe producers and is reflected in precautions such as vacuum deposition and baking for long periods after conventional plating.

The hot-work steels are difficult to machine in the hardened condition. Because of their experience with other hardenable steels, the aircraft companies generally take the view that solutions can be found to the problems that arise.

Northrop Aircraft, for example, does a lot of developmental work on machining. It has found means for handling AM-350, Inconel X, and titanium successfully. With this background, company personnel

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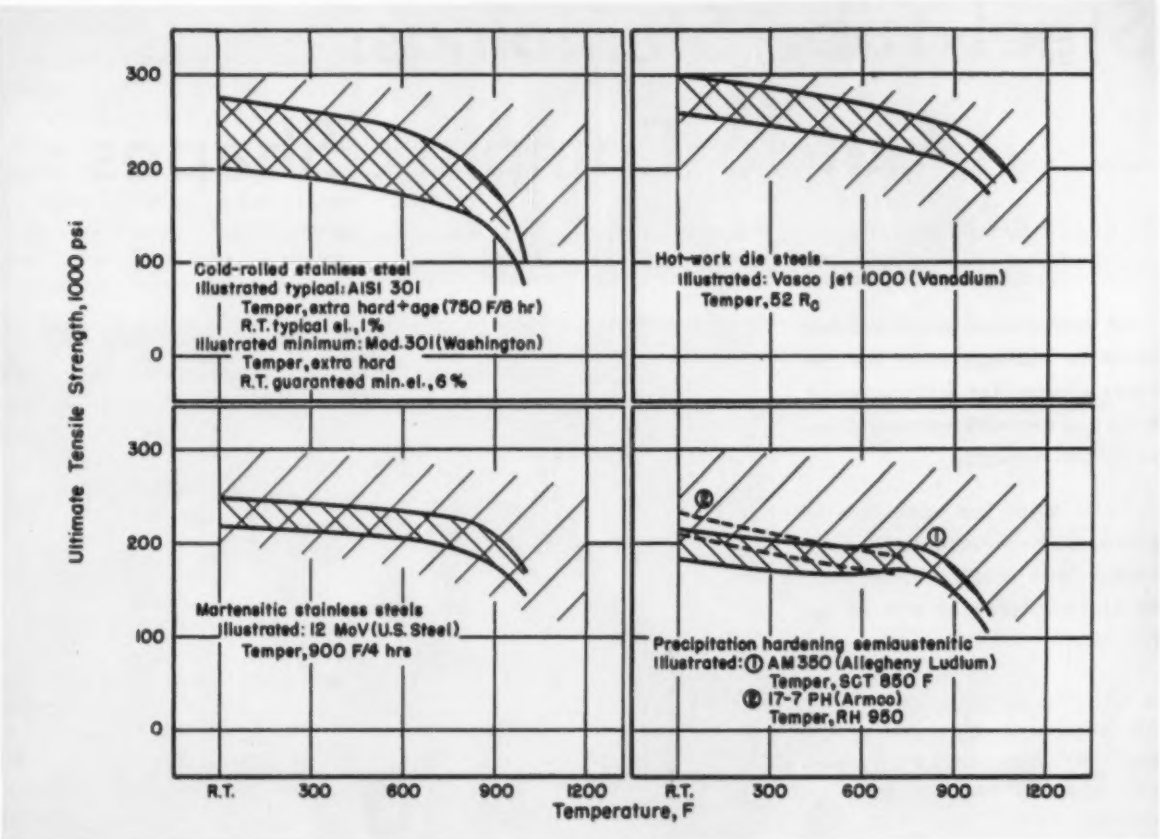
Part 1 of this survey, covering the important properties of hot-work tool steels, appeared in last week's issue.



COMPARISON: Plotted are typical and expected minimum tensile strengths of airframe sheet steels.

feel that they can also solve the problems that arise in machining hot-work tool steels.

Machine Soft—Fortunately, the overall machining problem is somewhat eased by the fact that in numerous applications little or no machining is required. There are also cases where most of the required machining can be done before the steel is hardened.

Some users have expressed concern that decarburization of hot-work steels may be a problem. Decarburization reduces both load-carrying ability and fatigue resistance. The influence of decarburization increases as the gage of the material decreases. This means it could seriously affect the properties of the thin gages.

From the consumer's standpoint, there are two possible sources of decarburization. One is decarburization in material as received from the supplier. Specifications exist to cover this situation. They are based on the hardness differential from the surface to the interior.

Unclear Specs — Convair feels that there is enough ambiguity in these specifications to impair their usefulness. This condition arises from the fact that the designated hardness differentials are of about the same magnitude as the normal expected error in individual hardness readings.

A second source of decarburization stems from heat treatment by the consumer. A number of precautions are taken to avoid decarburization. These include heat treating in an endothermic atmosphere, in molten neutral salts, and protecting the surface of the steel with various coatings. Chem Milling is reported to be a means of removing decarburization without hydrogen embrittlement.

Most consumers who are skilled in using hardenable steels appear to be obtaining mechanical properties from the hot-work tool steels that are in line with suppliers' claims. In some cases, consumers trying such steels for the first time find it hard to achieve expected properties. This is not unexpected. North American achieves high strengths with ductility at expected levels in production.

Some Complaints—Testing a variety of hot-work tool steels in the form of forged blocks, Boeing has observed poor transverse ductility. This is especially the case in the short transverse direction.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Steel-Tube Stampings: Short Cut to Complex Shapes

By **J. F. Hullman**—Design Engineer, Will-O-Hill Industries, Inc., Willoughby, O.

At first glance, machined bar stock or castings seem the obvious choices for making round, hollow parts with varying diameters and tapers.

Quite often the same sort of piece can be formed quickly and easily from welded steel tube, to close tolerances and at far less cost.

▪ When you can save 92 pct without altering product design, you might expect it to stem from a complex of costly machines and automation. Yet, it's being done every day merely by switching from solid bar stock to welded steel tube stamping blanks — letting regular steel tubing serve as the basic raw material, then deforming, cutting, machining or welding it to make the finished part.

Initial tubing cost is usually equal to or higher than for other materials; but this is more than offset by savings on machining and other processing.

At Will-O-Hill Industries, Inc., welded carbon steel tubing is the preferred material; it offers dimensional accuracy, uniform wall thickness, and other physical advantages. It also provides a high quality finish, free from roll-in scale, scabs and slivers, both inside and out.

Because it's dependably concentric throughout its entire length, welded steel tubing is often used as received. And finally, it comes in a wide range of sizes, wall thicknesses, shapes, grades and mechanical properties. This makes it possible to select a combination which minimizes the number of operations and simplifies converting it to a finished product.

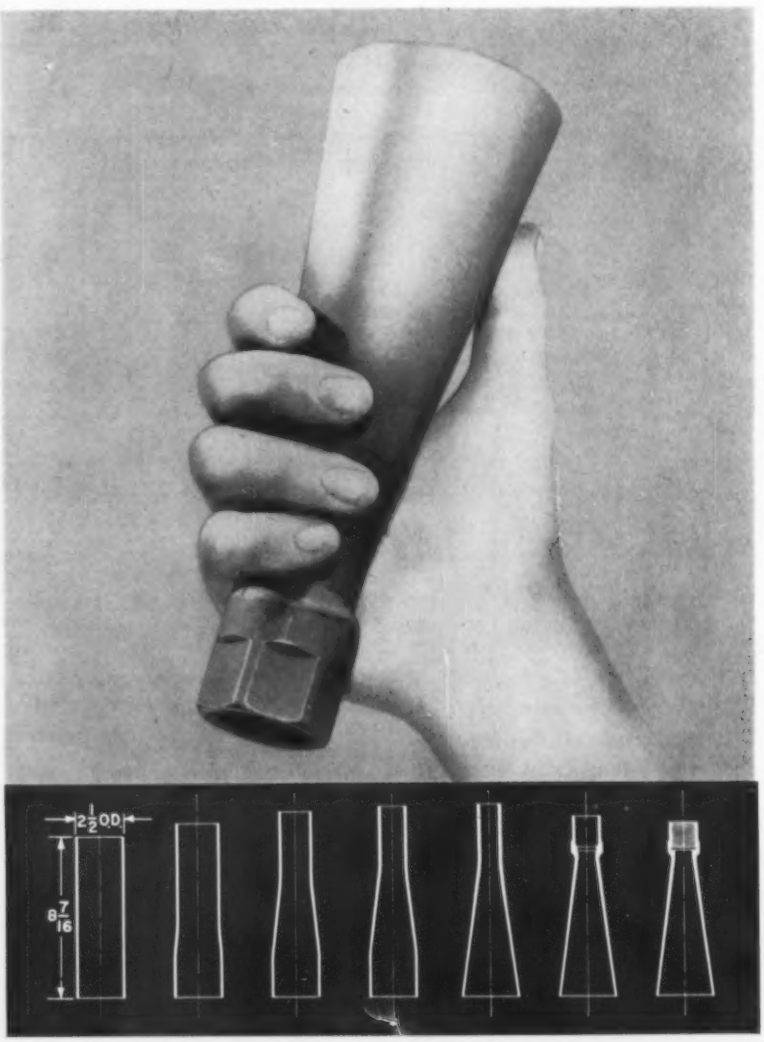


FIG. 1: Once machined from solid stock, machine gun flash hider is now made at 92 pct less cost from welded carbon steel tubing.

For the Right Tubing—It's important in preparing specifications for cold-worked welded steel tubing to acquaint the tube manufacturer with the nature of service for which the tube is intended. Specifications should include desired size and gage with tolerances for each, type of surface on the tube, and any special

properties required for fabricating and subsequent processing.

A good example of how tubing is processed into a finished part is the machine gun flash hider shown in Fig. 1. Starting with a 2½ in. OD by 8 7/16 in. long welded 1010 mechanical tubing with 11-gage wall thickness and flash removed, the 20-mm flash hider is formed cold in four press operations using external dies only. The fifth operation is hex-forming by hot forging and the last stage is internal threading.

Compared to machining from 3 in. solid stock, the tubular blank saved about 92 pct in terms of greatly increased production, less expensive labor and lower hourly-cost punch presses.

Trial and Error—Before quality and fast production could be achieved, it was necessary to determine how much the tubing could be pressed to unconventional but exacting shape. Since there are no published rules for behavior of press deforming on tubular blanks, this could be found only by careful experimentation.

Another instance where tubing made a tough job easy is the small sleeve for hydraulic power-steering pump shown in Fig. 2. The sleeve starts as a 7/16 in. OD welded carbon steel tube, cut to 2½ in. lengths as blanks. Offhand it seems simple; that is, until you take a look at the tolerances in size and finish.

Each unit is rolled to form a slight groove in the center. Leg-end diameters are held to ±0.003 in. for the full length of each 1⅛ in. leg. The 150° angle between legs is held to less than 0°10′, the equivalent of 0.0009 in. measured at extreme leg-ends. The sized ends must be in one plane within 0.0008 in. and finish is 16 rms or better. Distortions after heat treatment have to be kept to a few tenths. And on top of all this, it calls for monthly production of one-quarter to one-half million pieces, or about 15,000 a day, to supply nine pieces on each pump assembly.

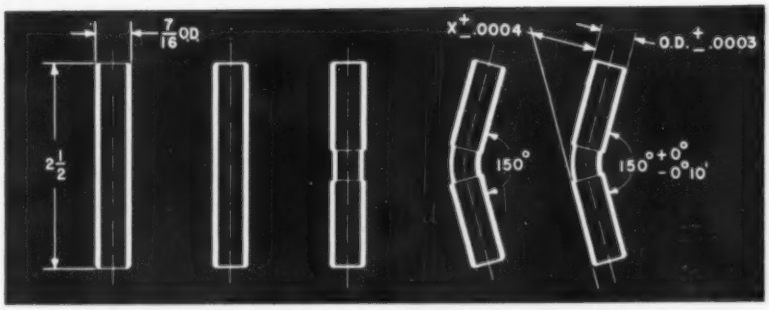


FIG. 2: Close-tolerance sleeve for power-steering hydraulic pump is formed in four steps, then sized to final dimensions in a fifth.

FIG. 3: Four stations of the sizing machine work simultaneously on both ends of the pump sleeve, accurately sizing it in 1.3 seconds.

How It's Done — First, welded steel tubing 7/16 in. OD is cut to 2½ in. lengths. Next, the tubes are chamfered outside and deburred inside. Then, the tubing is rolled to deform the center section. This reduction at the center allows excess metal at the ends to run out during subsequent burnishing. The diameter at the center portion can't exceed the finished outer diameter at any point.

In the fourth step, the tubing is bent in a hinging die to about 150°. And finally, the parts go through a finish sizing machine, Fig. 3. In

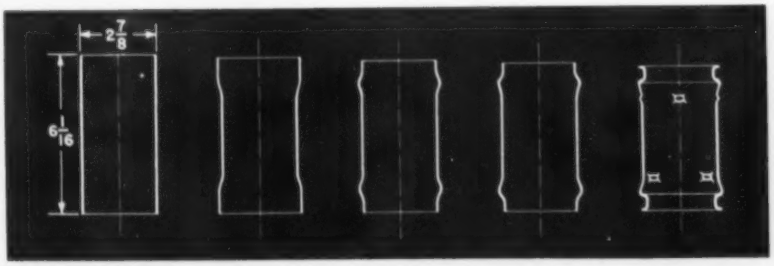


FIG. 4: O-ring failures on this water manifold prompted a switch to lighter welded tubing. Machining costs were also eliminated.

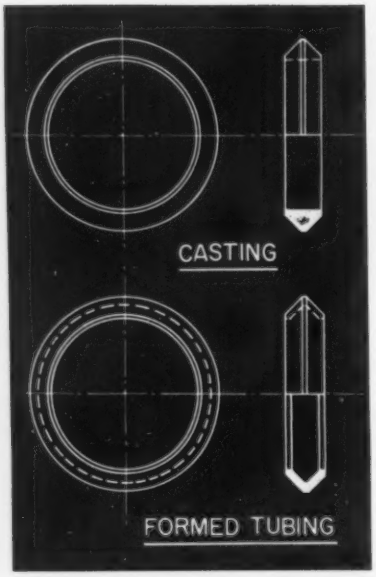


FIG. 5: Stronger and lighter weight welded tube replaced a more expensive casting for this exhaust ring, makes for lower unit cost.

the sizing machine four stations work on both ends at the same time.

To protect the delicate lineup of the machine, a dozen microswitches in series prevent the sizing action if any working parts are out of alignment more than a few tenths of a thousandth.

Light vs Heavy—Fig. 4 shows a typical case where a lightweight stamping blank of welded steel tubing replaced a heavy machined part made of tubing with wall thickness three times greater. The switch to lighter welded tubing for this water manifold resulted in faster and cheaper production and an improved, trouble-free part.

Grooves at the ends of the manifold must be held to precise machining tolerances to retain O-rings. In the original part O-ring failures were common, due to excessive weight of the manifold. The lighter tubular stampings completely eliminated the problem.

Final shape is obtained quickly in several press stamping stages. All eight nib-formed extrusions are formed in one blow. Their purpose is to retain snap rings.

Replaces Casting—The exhaust ring shown in Fig. 5 illustrates how welded steel tubing can replace a casting. The switch to a tubular stamping resulted in a better product by eliminating fractured castings, lowered unit cost, and reduced weight.

The part shown in Fig. 6 was originally a malleable casting used as a support in an automobile shock absorber. Will-O-Hill Industries has made millions of these from 3¼ in. sections of 1 in. OD tubular stamping blanks with ⅛-in. walls. Deforming of the tubular blank is done in seven reducing operations, followed by flattening, piercing and trimming.

Two press set-ups are used. The first press has a two-sled, cam-operated die with vertical transfer dial between two opposing die sleds. The opposing pairs of reducing die buttons are mounted on the sleds in circular positions conforming with stations in the transfer dial. A front view of the die assembly is shown in Fig. 7. The vertical transfer wheel rotates to carry workpieces from one station of opposed die buttons to the next.

Both Ends at Once—With each down-stroke of the press ram, the right and left sleds are cammed toward the transfer wheel. This carries each opposed pair of die buttons over both ends of one workpiece for the degree of reduction performed at that station. When the sleds retract on the up-stroke, stationary retainers or shedders prevent the workpieces from following the reducing die buttons. After each press stroke the transfer wheel is manually advanced one station by the operator.

The operator loads the transfer wheel, then follows the seven indexes and press strokes for the seven reductions. The eighth index automatically knocks the workpiece out of the transfer wheel. Once the transfer wheel is fully loaded, or once around, a finished piece comes off with each stroke of the press.

The second die press, Fig. 8, performs the last three operations. This horizontal rotary work transfer unit

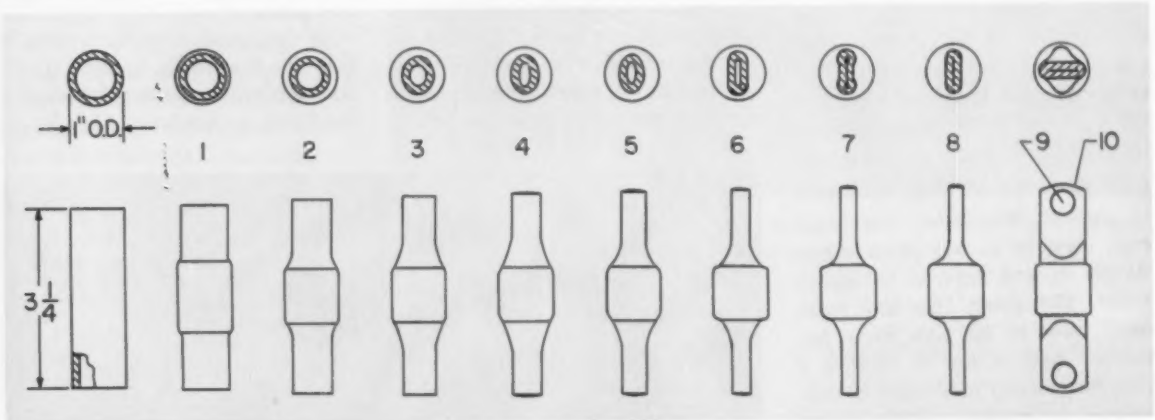


FIG. 6: The first seven forming and reducing operations on this part are handled by one press, the last three by another. A support for an automobile shock absorber, it was formerly a malleable casting.

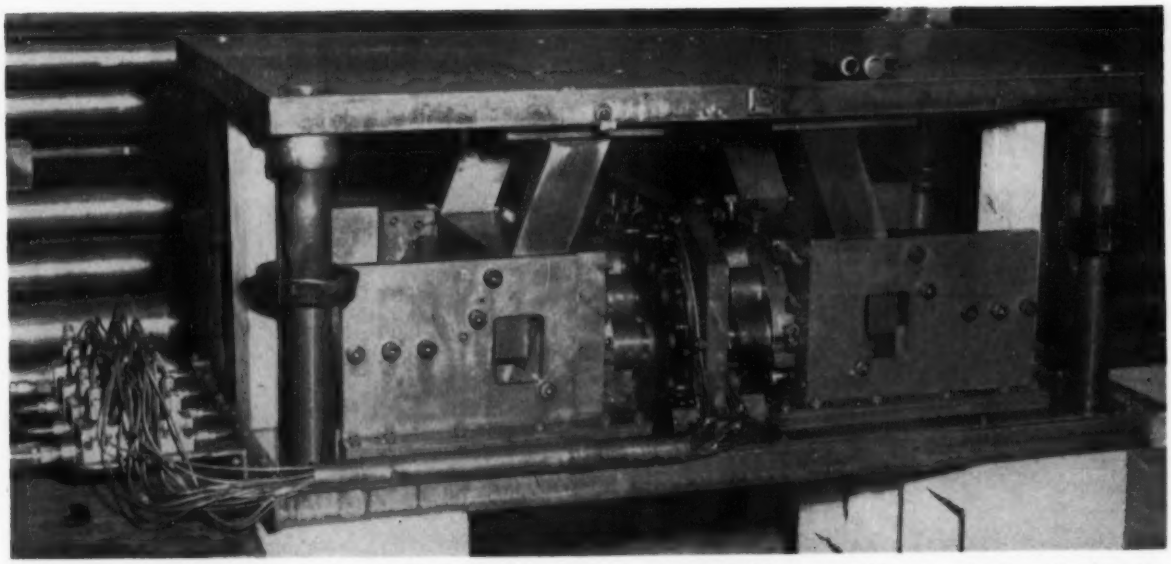


FIG. 7: Tooling setup for the part shown in Fig. 6 has cam-operated opposed-sled dies with vertical work transfer wheel between. Operator loads and advances the wheel manually after each press stroke.

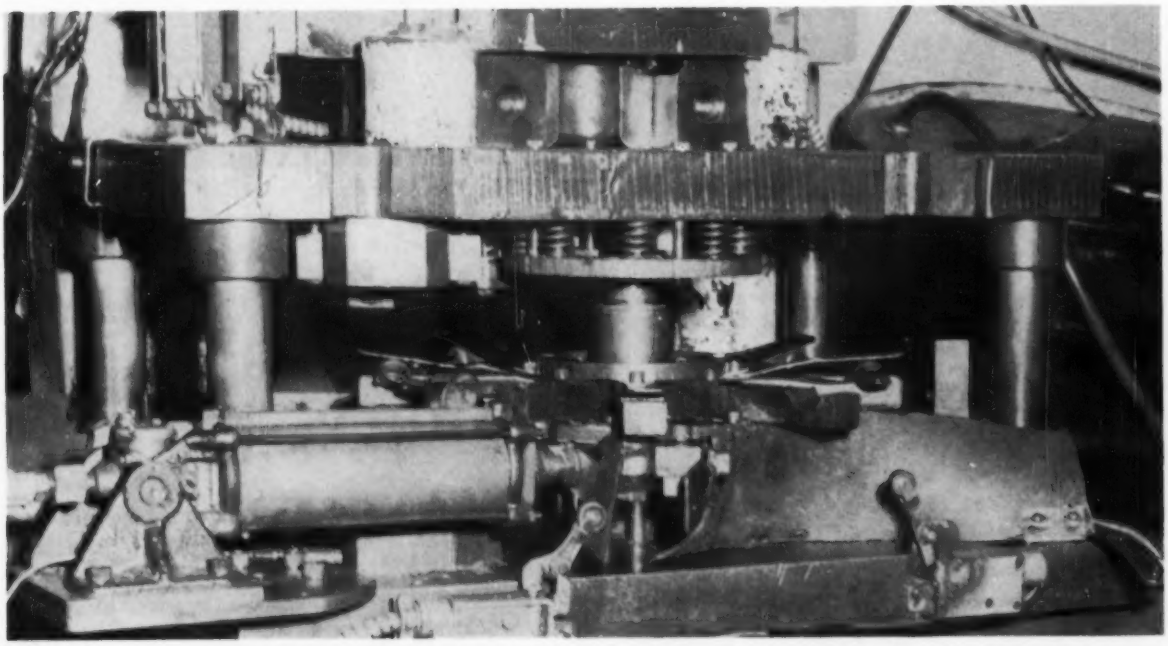
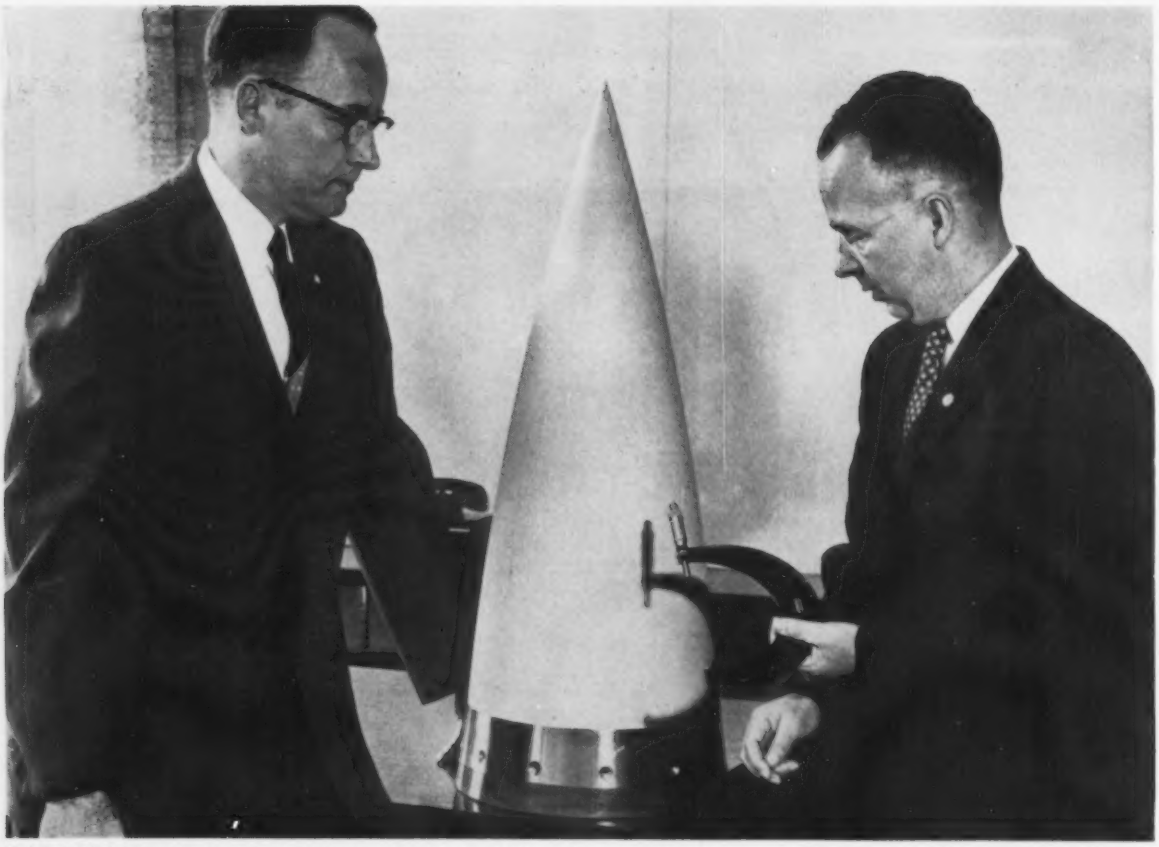


FIG. 8: Tooling on this press performs operations 8, 9 and 10 in Fig. 6. Horizontal automatic-index table carries work under punches for flattening, piercing and end-trimming both ends simultaneously.

has automatic indexing. Each of the three operations are performed on both ends of the piece simultaneously.

The die is equipped with vertical strippers and knockouts. The rotary transfer table moves workpieces under the flattening punches, the piercing punches, and the end-trimming or shaving punches. Work is automatically ejected from the carrier after the final trim.

The foregoing are only a few typical examples. Actually, tubular work blanks have almost unlimited possibilities. The ease and rapidity with which welded steel tubing can be formed, bent, machined or welded make it adaptable to countless mechanical applications.



RADOME: Corning researchers inspect guided missile radome made of Pyroceram.

New Material Combines Virtues of Metals and Ceramics

Basically a kind of glass, this new material can be formulated in different ways to provide a variety of properties.

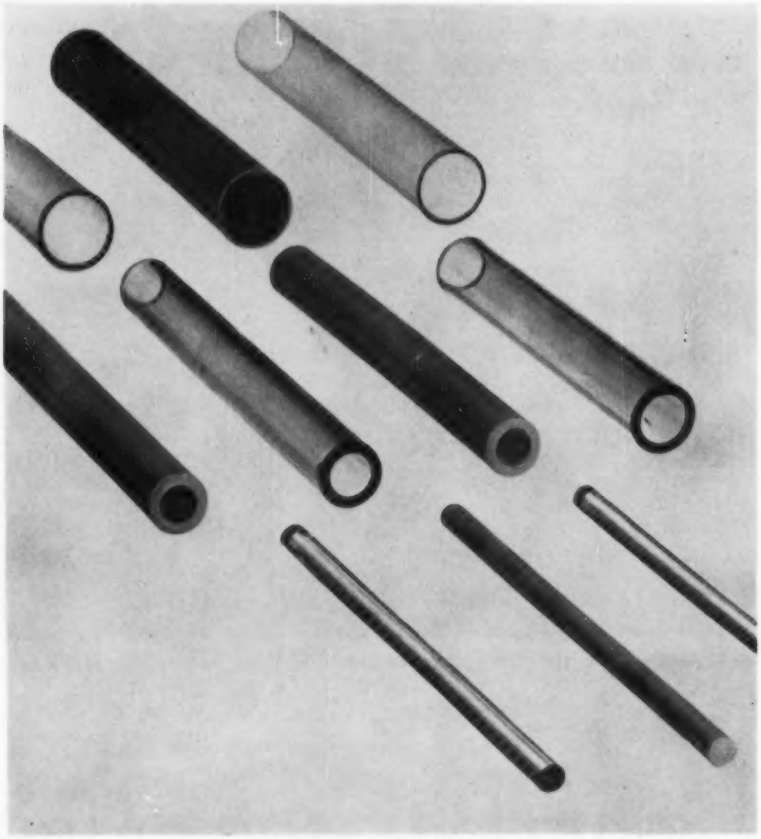
It's a development designers and engineers won't want to overlook.

■ An essentially crystalline material formed from a non-crystalline glass is the basis for an entire family of new, non-metallic materials. The family of new materials has been called "Pyroceram" by its developers, the Corning Glass Works, Corning, N. Y. Based on preliminary claims, it should prove to be exceptionally useful to both designers and engineers.

Because Pyroceram is not a single material, it can be individually formulated or "made to order" to suit a wide variety of desirable properties. For example, it can be made to have good mechanical strength, excellent electrical insulating properties at very high frequencies, high deformation temperatures, superior thermal shock resistance, and hardness.

Easy To Form—Expansion coefficients can be varied in this material from slightly negative to 200×10^{-7} per degree C. Some Pyroceram materials can be either transparent or opaque. And they can be made resistant to chemical attack.

In making Pyroceram, a glass batch containing one or more nucleating agents is melted, formed to a desired shape, and cooled. A heat treating cycle causes the nucleating agents to form billions of submicroscopic crystallites per cubic millimeter. Each crystallite acts as a center of crystal growth as the heat continues.



SHAPES: New material can be made in the form of rod and tubing.

After heat treatment, the end product is a fine-grained crystalline material. It is nonporous and harder than most ceramics and many metals. Still, the new material differs from glass in that it is essentially crystalline in nature. It differs from ceramics in that its crystalline structure is much finer.

Harder Than Stainless — Pyroceram materials are rather low in density, somewhat below aluminum, and may be made with much greater hardness than the parent glass. One of them, in fact, is three to four times as hard as Type 302 annealed stainless. Nonporous, they are also as impermeable to gases as the best glasses. Thus they can be used for the construction of high-vacuum equipment.

One of the more remarkable traits of these new materials is the fact that some of them can remain transparent in final form. This means the crystals are tiny and sufficiently close to the refractory index of the matrix material to be transparent. They can be made with a wide range of appearances from clear through various stages of diffusion or smokiness up to completely opaque, white products.

Good Insulator—These materials can be made with extremely good electrical properties, particularly in the field of dielectric loss, even at red heat. Materials having high dielectric loss will absorb the energy of electric waves and will not act as good insulators. According to tests, Pyroceram materials rank among the best in their ability to insulate in an electrical field without themselves becoming heated by the field.

One grade of Pyroceram has a flexural strength of 37,000 psi, compared to 20,000 for steatite and 5,000 for window glass. The elasticity of some of the new materials is nearly twice that of average glass and about two-thirds that of steel. These same materials maintain their strength at temperatures as high as 1380°F. They will not scale at these temperatures and resist impact even at red heat.

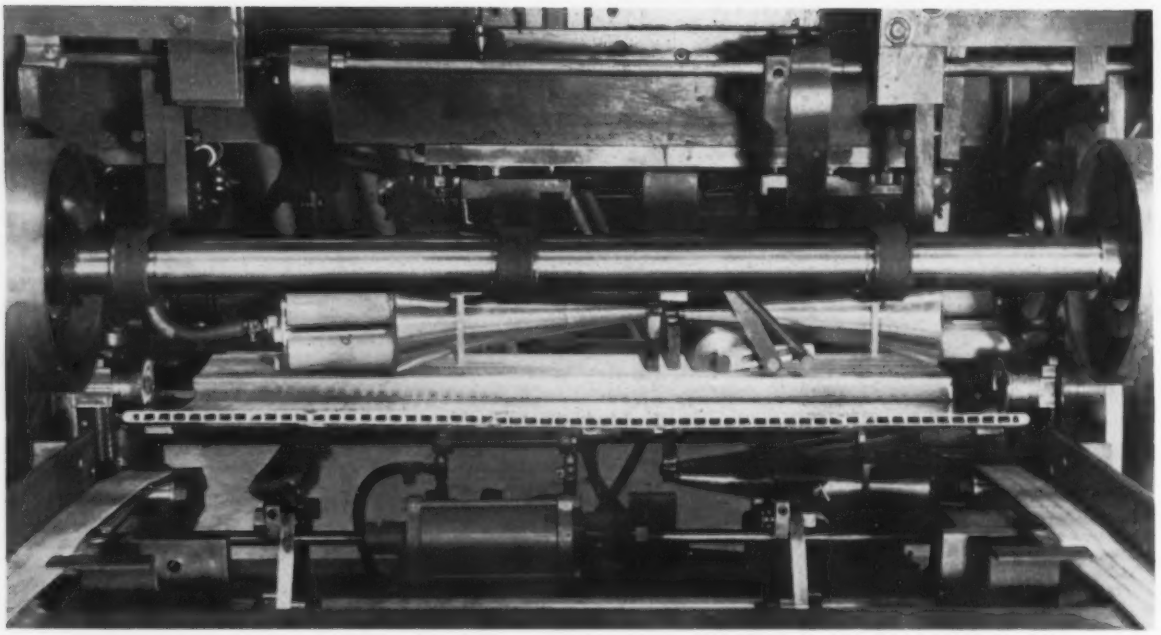
Mass Production Item—According to Corning, the most remarkable aspect of the new materials is that they can be formed by known glass-forming techniques. This means that the materials can be adapted to the mass production methods applied in the glass industry. They can be cast to shape, blown into thin-walled vessels, pressed into dishes or lenses, or drawn into tubing and rod.

Here are some details on both the forms and formability of Pyroceram grades (which Corning refers to as "Codes"). For example, Codes 8605 and 8606 are very fluid in their glassy state and readily lend themselves to both centrifugal and investment casting. Conical shapes over one foot in diameter and about 3 ft long have been centrifugally cast. Experimental work is being done in casting by lost-wax investment casting techniques.

Right Viscosity — How about blown shapes? Codes 8607 and 8606 in their molten state have a viscosity similar to borosilicate glass. They have been hand-blown into a number of items: flasks, cylinders, beakers. It is certain that they can be machine-blown into vacuum-bottle liners, bottles, jars, urn liners, and other industrial products.

These same grades are also the most easily adaptable to pressing. This is because of their longer glass-working range. Test runs have produced pressed ware such as crucibles, flat pans, high-walled and low-walled containers.

Using the same grades, sheet glass, tubing and rod are formed by drawing or pulling molten glass from a melting tank. In the glassy state, these materials have been drawn into solid rod and tubing.



JOINS WITH SOUND: Transducer amplifies vibrations through aluminum cones as four heads weld at 50 ipm.

Continuous-Seam Ultrasonic Unit Joins Thin Metal

Ultrasonic welding is rapidly growing into an ever more versatile production tool.

With automatic, multiple-head continuous-seam equipment now available, it promises to solve some knotty joining problems.

▪ A new ultrasonic welder built by Gulton Industries, Inc., Metuchen, N. J., not only makes a continuous seam, but does so automatically.

Similar in performance to standard electric seam welders, the ultrasonic unit bonds a variety of dissimilar or similar metals, such as aluminum to stainless steel or aluminum to itself.

On aluminum it operates at a speed of 50 ipm. There are eight welding heads — four above the work and four below, arranged in pairs on opposite sides of the machine. Two pairs operate in one direction and two pairs in the other. Since four heads are working at the same time, total seam production is 200 ipm.

Flexible Design—Set up to join corrugated sheets to curved aluminum extrusions, the unit welds 30-in. seams. A slight change in mechanical equipment would allow for longer seams.

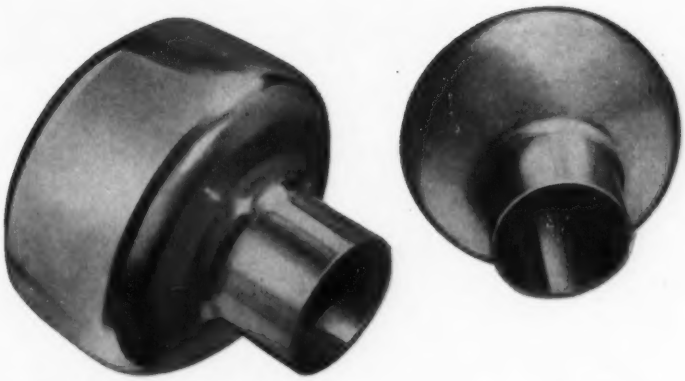
While it was built for welding semi-circular sheets in 11 different radii, the machine can be made to weld flat sheets. Once it's set up for a job, the operator has only to stack sheets, turn on the machine, and remove finished work.

A self-monitoring device shuts the unit down in case of failure. Panel lights on the control board pinpoint defective parts.

Transducer is Key—Each welding head is driven ultrasonically at about 20,000 cps. The barium titanate transducer amplifies vibrations through a welding tool to the interface of the joint. Only light pressure is needed.

The machine welds sheets 0.010-in. thick to pieces 5-in. thick or more. Sheet thickness can be varied from 0.080-in. down to thin foils. Seam width is 0.010-in.

Standing 13 ft high, the unit weighs 3 tons. Two 2-kw generators operate alternately with the forward and backward motion of the welding heads, supplying 500 watts to each head.



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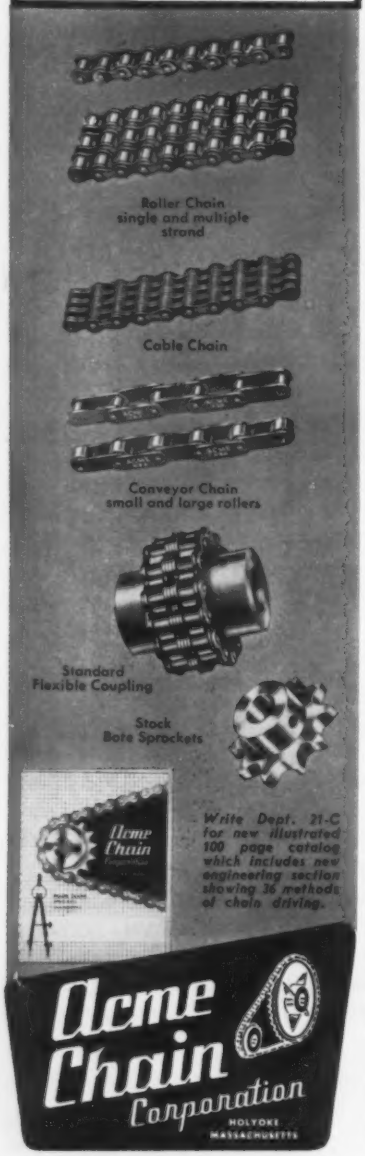

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 135.

Lubricant

Lubricant packaged in cartridges and applied from a grease gun is covered in a bulletin. It's a lithium soap base heavy-duty lubricant which combines assets of calcium and sodium soap thickeners with lubricity of molybdenum disulphide powder. (The Alpha - Molykote Corp.)

For free copy circle No. 1 on postcard p. 135

Tape-run Grinders

Precision grinding machines and tape-controlled positioning tables are described in an 8-page brochure. Covered are four models of rotary surface grinders, chuck sizes 8 to 40 in. (Arter Grinding Machine Co.)

For free copy circle No. 2 on postcard p. 135

Heat Controls

"Got a temperature control problem?" asks a folder. If so, maybe a control unit it describes can help you. It tells how such units let equipment operate at high speeds, requiring little maintenance for long life and cut costs. (Fenwal Inc.)

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Switches

Rocker-actuated electrical switches described in a data sheet combine advantages of both toggle and pushbutton control. (Micro Switch Div., Minneapolis - Honeywell Regulator Co.)

For free copy circle No. 4 on postcard p. 135

Cable Assemblies

Pre-fabricated wire rope assemblies for original equipment installation are announced in a bulletin. Use of these assemblies avoids hand splicing, socketing, or other attachments which are bulky and do not always develop the full strength of the rope. (Macwhite Co.)

For free copy circle No. 5 on postcard p. 135

Surface Grinders

Hydraulic surface grinders are presented in a 29-page bulletin. Horizontal spindle, vertical spindle and extra heavy-duty double housing models are included. So are special precision "way" grinders. Tables range from 8 to 40-ft long. (The Hill Acme Co.)

For free copy circle No. 6 on postcard p. 135

Nickel-copper Alloy

A new technical bulletin analyzes a tungsten-nickel-copper alloy. The bulletin includes data on applications, purchasing, and machining. (Firth Sterling, Inc.)

For free copy circle No. 7 on postcard p. 135

Power Transmission

A new concept in power transmission is introduced in a brochure. Described as particularly suited to linear actuators, hermetically sealed pumps and valves and large-ratio speed reduction devices, the bulletin says the technique is the first which

uses a controlled deflection wave for transmission of power and information. (For free copy write on company letterhead to Research Div., United Shoe Machinery Corp. 140 Federal Street, Boston, Mass.)

Lab Furnaces

Compact, lightweight laboratory furnaces are outlined in a 4-page bulletin. These furnaces provide continuous or intermittent operating temperatures from 1000°F to over 3350°F for testing or processing small samples. (Selas Corp. of America)

For free copy circle No. 8 on postcard p. 135

Plant Planning

The importance of including materials handling in the advance planning stage, when new industrial buildings are being considered, is stressed in a survey. The report describes how a steel company successfully integrated all of its receiving, processing, warehousing and shipping operations around a streamlined system of mechanical handling. (Towmotor Corp.)

For free copy circle No. 9 on postcard p. 135

Power Drives

Adjustable speed drives are depicted in a 12-page bulletin. Available from 5 to 200 hp, such units are variable-voltage dc drives that use ac as a power source. (Louis Allis Co.)

For free copy circle No. 10 on postcard p. 135

Aluminum Bearings

Modern diesel engines place strenuous demands on main and connecting rod bearings. A new booklet argues that aluminum alloy bearings perform best in many cases. (Caterpillar Tractor Co.)

For free copy circle No. 11 on postcard p. 135

Pallet Truck

Described in a bulletin now available is a new 3000-lb capacity hydraulic hand pallet truck. For narrow aisle applications, the truck

Only a press which is completely new from top to bottom can meet the exacting requirements of Joint Industry Conference Standards. That is what you get in this new Oliver-Farquhar OBI Mechanical Gap Press. Sturdy full-length guides increase your tool and die life. J. I. C. bolster plates with J. I. C. T-slots and centers make it possible to change dies from one press to another without difficult adjustments.

Slide adjustment screw, easily accessible from floor-level, makes climbing unnecessary. Cooler operating, low inertia clutch permits higher cycling and reduces maintenance to a minimum.

Because it has all these new features and because it is designed and built to J. I. C. Standards, the new Oliver-Farquhar OBI Gap Press will assure the continuous operation of your production line. There is real cost-saving efficiency built into this press for your forming, blanking, drawing, bending and assembling operations.

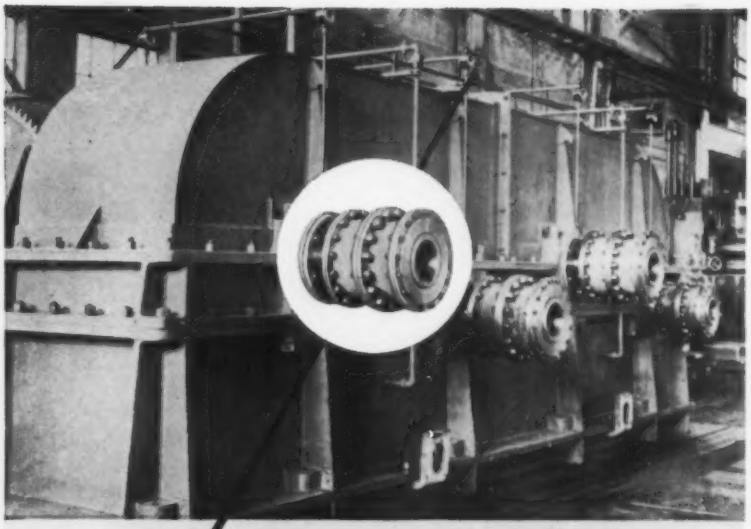
Available in four capacities—75, 110, 150 and 200 ton.

Write, wire or phone for complete descriptive circular, prices and delivery dates.

A. B. FARQUHAR DIVISION
The Oliver Corporation
Press and Special Machinery Department
York 28, Pennsylvania

OLIVER Farquhar PRESSES

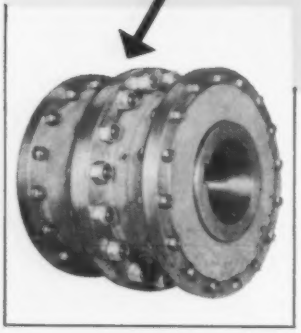
Also Manufacturers of Hydraulic Presses and Conveyors



Waldron heavy duty mill type couplings on rod mill

WALDRON

flexible couplings...



USED IN HUNDREDS OF DIFFERENT APPLICATIONS BUT ALWAYS FOR THE

same 3 reasons

1 STRENGTH — Hubs and cover sleeves for sizes 1¼ A through 7A are machined from tough steel forgings. Hubs are keyed to the shafts. The two one-piece cover sleeves function as a single, rigid unit serving as a floating connecting link between the hubs. High strength of forgings makes possible a very compact coupling with low rotating inertia.

2 RELIABILITY — There are no flexible parts to bend or break and the coupling is dust, moisture, and oil tight. Patented Walflex seal is at the lowest possible diameter where centrifugal force is least. Clearance between teeth in hubs and sleeve is engineered so that an oil wedge always separates them, taking the wear.

3 SERVICE — Plenty of rough bore couplings, already assembled—on the shelf for *immediate* delivery. Finish bored standard couplings shipped to meet customers' schedules. We are geared up to give you realistic delivery on *any* type of couplings.

Ask for Catalog 57

JOHN WALDRON CORP.

NEW BRUNSWICK, NEW JERSEY

Representatives In Principal Cities

Export Agents—Frazar & Co., New York, N. Y.

FREE LITERATURE

is offered with floor saving rubber tired front wheels and aluminum rear wheels. Carrying frame sizes range from 18 to 30-in. wide, 30 to 60-in. long. (The Raymond Corp.)

For free copy circle No. 12 on postcard p. 135

Thermometers

Straight form thermometers in a new line are introduced in a producer's literature. It describes instruments especially developed for use on top of tanks and boilers or other installations where it's impractical to use the standard angle form unit. (W. C. Dillon & Co., Inc.)

For free copy circle No. 13 on postcard p. 135

Architectural Metal

Architectural aluminum stocks are reviewed in an extensive catalog. It lists architectural aluminum items immediately available from distributors and jobbers throughout the country. (For free copy write on company letterhead to Aluminum Co. of America, Pittsburgh 19, Pa.)

Ultrasonic Testing

Profitable applications of ultrasonic inspection methods for quality control, production testing and preventive maintenance are described in a booklet. (For free copy write on company letterhead to Sperry Products, Inc., Danbury, Conn.)

Transfer Machines

Line and rotary transfer units and special production machines are illustrated in a 12-page booklet. One particular unit shown is an automatic line transfer machine; it performs three types of operations on a V-type crankshaft. The complete sequence of operations is detailed and illustrated. (The Producto Machine Co.)

For free copy circle No. 14 on postcard p. 135

Designed by DoALL to machine your big jobs!

DoALL Model 26-5 Heavy-Duty Band Mill—designed to perform straight-line metal parting beyond capability of ordinary band-tooled machines. Work capacity is 24" x 26". Band tool is Demon 2" high-speed steel blade. Work table has 2-ton capacity, with 40-inch stroke powered by fluid drive operating ball screw feed . . . providing smooth . . . positive . . . movement down to .030" per minute. Power is 10 hp. variable drive, with speed range of 55 to 5000 fpm. Extra work height, table load capacity and stroke length available as required.

Fast, simple operation—electrically controlled, hydraulically actuated.

SLASH COSTS, IMPROVE FINISH, SAVE MATERIAL with WORLD'S FASTEST BAND MACHINING

a New Production Era for Band Sawing

Because of new Demon HSS blade performance, we introduce this new line of machines

Ask About Our Lease Plan

DoALL originated the leasing of machine tools. Its successful operation for many years can mean immediate savings to you. All DoALL machine tools can be leased at low rental with purchase option.

Extremely powerful—oil-smooth in operation—this big, versatile DoALL Model 26-5 Heavy-Duty Band Mill can save you up to 90% in straight-line precision metal parting.

Rip through heavy plate . . . trim large castings . . . slab billets . . . face or shank die blocks . . . split bearings and bushings—with the greatest speed, precision, and material savings available today.

Here is a rugged, precision-built machine tool that removes large sections of metal in one pass with phenomenal accuracy and big savings in material (no chip waste)—handling the biggest, most awkward pieces with only simple hold-downs for fixturing.

Find out what this advanced form of band machining can do in your own operations. Call your nearby DoALL Store. Ask for a demonstration of the DoALL Model 26-5 Heavy-Duty Band Mill.

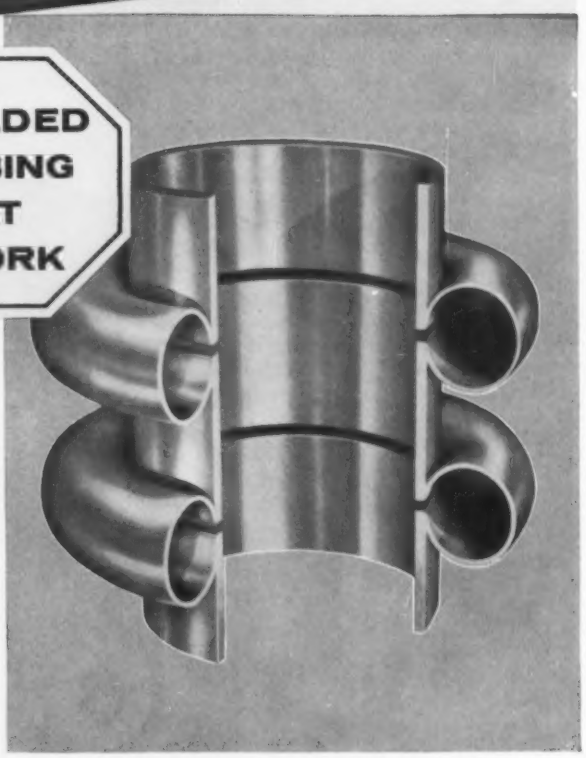
B-50

This is a typical DoALL Store

THE DoALL COMPANY, Des Plaines, Ill.

Design with TUBING in mind!

The hydraulic cylinders operating this Back-hoe fabricate best from Welded Carbon Steel Tubing because of good honing characteristics, uniform roundness and concentricity.



Welded Stainless Steel Tubing formed into this packless expansion joint has served 15 years without failure at temperatures to 1800°F and pressures up to 10,000 psi.

When you need precision · strength · durability

CHOOSE WELDED STEEL TUBING

Carbon · Alloy · Stainless Steel

The uniformity of Welded Steel Tubing recommends it for the most exacting applications. When you need close fit, precise cross section and rugged durability your best answer is Welded Tubing. If your problem is heat, pressure, corrosion or uniformity of grain structure and surface, your best answer again is Welded Tubing. For all tubing applications, consult a quality tubing producer.

An Association of Quality Tube Producers

FORMED STEEL TUBE INSTITUTE — FSTI

Design inspiration for you

The 260-page Handbook of Welded Steel Tubing contains inspiration and data for tubing designs. For your copy, write on your company letterhead, giving your title.

FORMED STEEL TUBE INSTITUTE
850 HANNA BUILDING • CLEVELAND, OHIO

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Industrial Taxes

"The improved Pennsylvania tax climate" is extensively analyzed in a 7-page booklet. It tells how a number of major steps have been taken in the commonwealth during 1957 to create tax conditions favorable to new industries and the expansion of already established ones. (Commonwealth of Pennsylvania, Dept. of Commerce.)

For free copy circle No. 15 on postcard

High-heat Switch

A new switch is described in a bulletin as having the highest available electrical rating for its size of any switch designed for use at 600°F. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 16 on postcard

Arc Welding

Arc welding news is contained in a 16-page booklet. It includes many articles describing time and money saving applications. (Hobart Brothers Co.)

For free copy circle No. 17 on postcard

Set Screws

Serrated or knurled cup point set screws are now offered in a special type for use in the hopper feeding. A bulletin describes them. (Set Screw & Mfg. Co.)

For free copy circle No. 18 on postcard

Industrial Films

More than 70 films describing work simplification and industrial engineering techniques are included in a film rental catalog. The 16MM films are approximately 10 to 15 minutes long in running time. (Industrial Management Society.)

For free copy circle No. 19 on postcard

Industrial Trucks

How Celanese Corp. of America uses trucks powered by nickel-iron-alkaline storage batteries to bridge complex manufacturing processes with simplified material handling is described in a publication. (Storage Battery Div., Thomas A. Edison Industries.)

For free copy circle No. 20 on postcard

Cermet Cutters

A bulletin provides details on a new cermet cutting material. It contains neither tungsten nor cobalt. A tool life section features a cutting speed vs. tool life graph. (Firth Sterling, Inc.)

For free copy circle No. 21 on postcard

Testing, Inspection

Pneumatic comparator gages for use in inspection and quality-control fields are described in an 8-page folder. (Moore Products Co.)

For free copy circle No. 22 on postcard

Cutting Tools

Cutting tools available from one producer are contained in a bulletin. It gives catalog numbers, prices, cutting diameters, and length of tools. Tools include: ground rotary cutters, countersinks, solid carbide end mills. (For free copy write on company letterhead to M. A. Ford Co., 1545 Rockingham Road, Davenport, Iowa.)

Welding Flux

Aimed at users of submerged arc welding on stainless or low alloy steels, a 4-page booklet demonstrates effects of varying welding speed, current, voltage or flux burden. It discusses fringe influences of the various observable results. Text also lists color coding of one mak-

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **3/6/58**

Circle numbers for Free Technical Literature on Information on New Equipment:

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31	32	33	34	35	36	37	38	39	40
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BUSINESS REPLY CARD

No postage necessary if mailed in the United States

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THE IRON AGE

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Village Station

NEW YORK 14, N. Y.

BUSINESS REPLY CARD

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FREE LITERATURE

er's fluxes for submerged arc welding, alloys to be welded with each, and approximate composition of the weld deposit produced. (Arcos Corp.)

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Mill Regulator

In six pages a folder describes a dual-circuit mill regulator. This fail-safe electronic unit provides precise regulation of line speed, voltage and tension for continuous-process operations. (Reliance Electric & Engineering Co.)

For free copy circle No. 24 on postcard

Contactors, Relays

A 32-page catalog passes along data on one maker's dc contactors and relays. (General Electric Co.)

For free copy circle No. 25 on postcard

Foot Shears

Features of one maker's squaring shears for light sheet metalworking are reviewed in a dozen-page bulletin. (Niagara Machine and Tool Works.)

For free copy circle No. 26 on postcard

Beryllium Metal

Beryllium metal's uses and properties are discussed in an 8-page brochure. It covers general characteristics of the lightweight material, forms in which it's available, and prices. Recommended handling methods are briefly touched on. (The Beryllium Corp.)

For free copy circle No. 27 on postcard

Tantung Tools

Where and how to use tantung in the form of solid tool bits, tipped tools, cut-off blades, toolholder inserts and preformed tools and blanks, and for many wear applications are described in a new 12-page booklet. Tantung consists principally of cobalt, chromium, tungsten, columbium and carbon. (For free copy write on company letterhead to Vascoloy-Ramet Corp., Waukegan, Ill.)

Electrification

Enclosed conductor systems for cranes, monorails and moving machinery are described in a 6-page brochure. It states that these systems meet all safety and installation requirements of mobile electrification. (Insul-8-Corp.)

For free copy circle No. 28 on postcard

Magnesium Alloys

Magnesium-thorium alloys and industrial health experiences in Fabricating them are presented in a bulletin. It discusses radioactivity of thorium-containing alloys as observed in past experience and recent studies. Conclusion is that "relatively low radioactivity (of these alloys) presents no unusual problems." (Dow Chemical Co.)

For free copy circle No. 29 on postcard

Tool Sharpening

How a Profilometer can increase tool life through accurate measurement of tool finish is told in a 4-page bulletin. Longer tool life and improved surface finishes are possible through proper tool sharpening, it points out. Included is a case history of an electrical equipment maker who increased tool life 95 pct. (Micrometrical Mfg. Co.)

For free copy circle No. 30 on postcard

Power Transmission

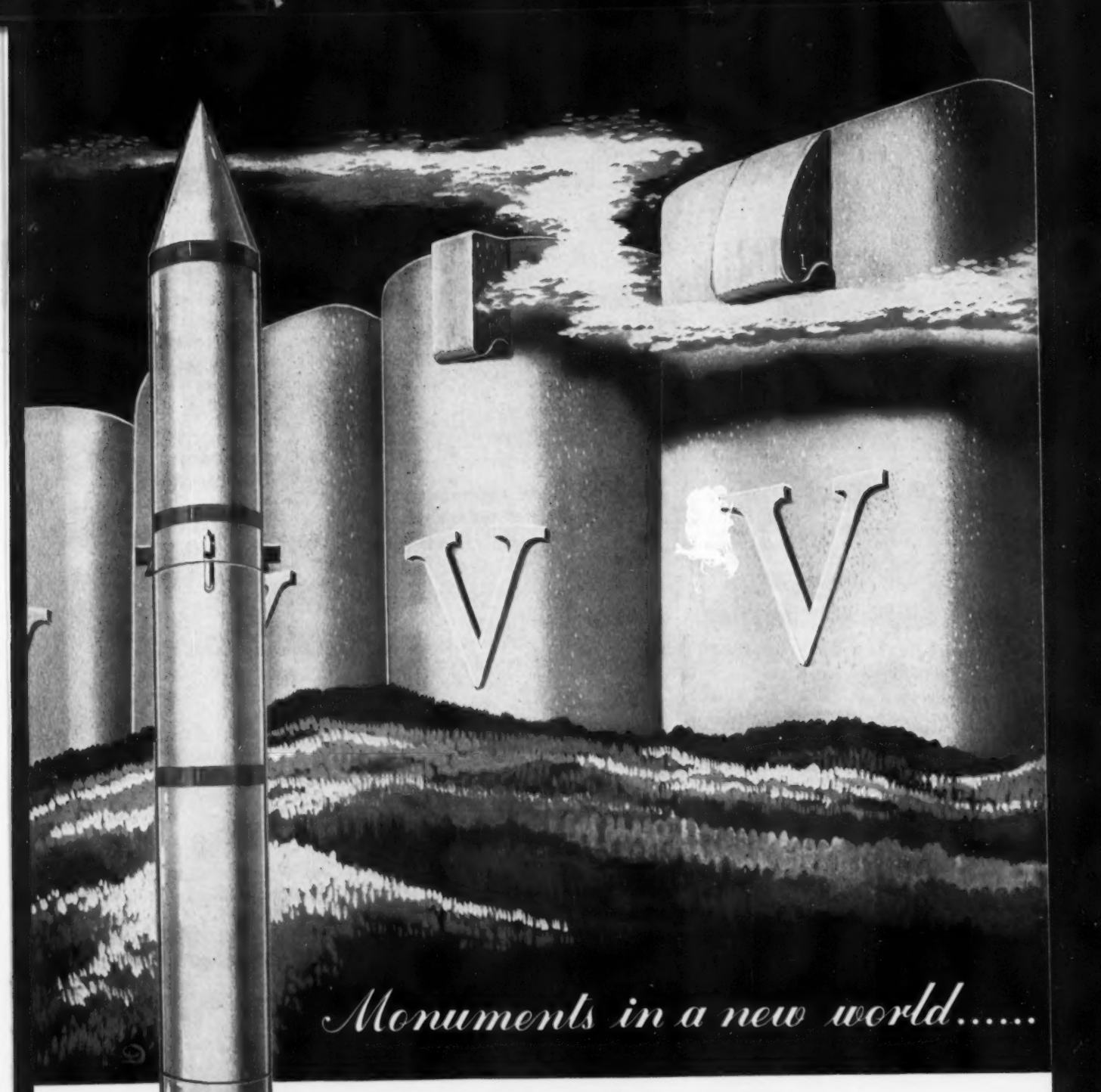
Mechanical power transmission and conveying machinery is covered in a catalog. It contains data on products for power transmission, conveying and elevating service. (Chain Belt Co.)

For free copy circle No. 31 on postcard

Rectifiers

Semi-conductor rectifiers are featured in a bulletin. It covers germanium, silicon and selenium units. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 32 on postcard



Monuments in a new world.....

Valley ingot moulds are designed for individual steel plant conditions. These moulds meet today's metallurgical requirements

VALLEY MOULD AND IRON CORPORATION

GENERAL OFFICES: HUBBARD, OHIO

Western Office: Chicago, Illinois. Northern Office: Cleveland, Ohio

expect and
get the best
in drop-forgings
by **Williams**

It takes years (over 75) to acquire the particular skill Williams offers in solving difficult forging problems... economically, efficiently. This experience, complete facilities and equipment enable Williams to turn out jobs for you which others turn away.

Whether your forging requirements are aluminum, brass, bronze, titanium, monel or carbon, alloy or stainless steel... it's time to call in Williams. Chances are, they can help you buy and use drop-forgings to better advantage.

FREE Drop-Forgings Brochure
This new brochure tells a detailed story of Forgings by Williams which offer advantages that can't be duplicated. Write for your copy today.

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407 VULCAN ST.
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DROP FORGED
Look for these Marks of Quality

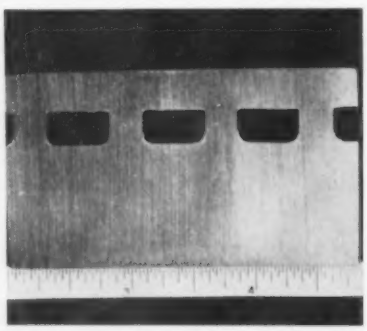
TECHNICAL BRIEFS

Channel-clads Plate Via Vacuum Method

Heavy composite plate shows signs of being an excellent heat-transfer medium. Between the primary metal layer and the alloy layer are empty passageways.

Getting these channels into the heart of the plate isn't easy. But a new vacuum cladding method makes it possible.

▪ Thanks to a new vacuum cladding method, heavy composite plate is finding new opportunities as a heat-transfer medium. The heavy base plate, usually steel, is channeled before the alloy or nonferrous layer is applied. These channels form coil-like passageways in the very heart of the finished clad plate.



Cutaway closeup view shows ½ x ¼-in. channels between layers.

The finished plate material is actually full of holes. To be sure, these are precision-located holes or channels located at a selected distance from either surface.

Produced by Chicago Bridge & Iron Corp., Birmingham, the new channeled material has already been applied for precise surface temperature control in the venturi sections of hypersonic wind tunnels and the heated platens of laminating presses. In reactors and vessels it provides internal heating (and cooling) of critical partitions.

Eliminates Coils—The use of channeled clad plate can eliminate bulky surface coils and double-wall constructions in some instances. The fact that internal channels are formed by vacuum cladding means new metallurgical leeway in selecting base material and clad surface compositions.

In the metal producing, metalworking and machinery fields greatest interest seems to center about heavy chill plates for handling hot work and heated platens and forms for molding and assembly operations. Channel cross sections may vary in size. Depths range from ¼ to 1 in. and widths from ½ to 1½ in., depending on cladding thickness.

Many Combinations Possible—Dozens of cladding and base plate combinations have been successfully used in channeled plate. Many other types are being tested in the laboratory.

There appears to be no reason why all the cladding materials available as solid clad plate cannot be used for this channeled plate appli-

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 135. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

cation, says its producer. These include austenitic stainlesses such as 304L, 316L, 321, 347, 318 and 17-7 PH; straight chromium stainless such as 403, 405, 410 and 430; and nonferrous materials such as nickel, Monel, Inconel, Hastelloys B. C and F, silver, copper, cupro-nickel alloys, brass, and Carpenter 20 Cb.

Other less common materials such as titanium, zirconium, bronze and tantalum are foreseen as claddings for channeled plate in the near future.

Steel Base Is Usual—The most popular base materials, of course, are low carbon steels of firebox quality. Occasionally other base materials are used for specific properties as in titanium-on-copper. Plastic laminating press platens have been made of air hardening 6 pct chromium alloy steel on mild steel.

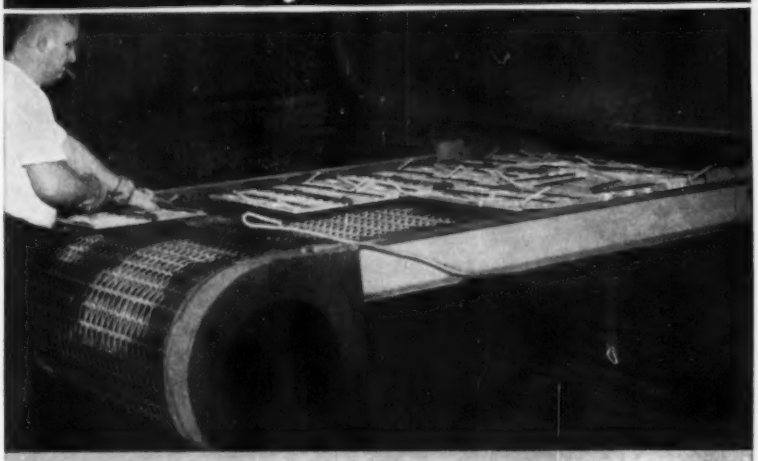
Channeled plate roll-bends with no signs of adverse effects.

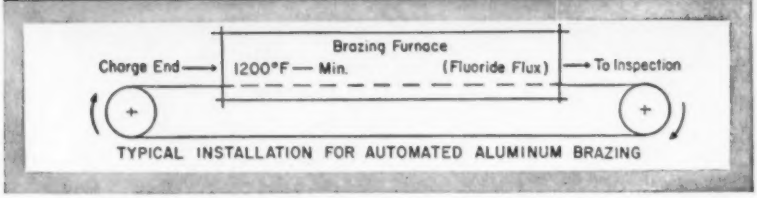
Many production plates (for wind tunnel and reactor work) have been constructed of 5/16-in. thick 405 stainless on heavy mild steel. So has 403 stainless, on 403 stainless backing. Plates produced for field use so far have been up to 220-in. long and 60-in. wide.

New Caster Standards

The Caster and Floor Truck Mfrs' Assn. has released its new standards for industrial casters. These standards provide users with convenience and economy of interchangeability. They discuss selec-

Cambridge WOVEN WIRE BELTS





TYPICAL INSTALLATION FOR AUTOMATED ALUMINUM BRAZING

METAL-MESH BELT CONTROLS PRODUCT UNIFORMITY IN CONTINUOUS BRAZING

Here's a belt that not only shrugs off hot atmospheres and corrosive fluxes, but helps produce uniformly brazed parts continuously —and in less time. Moving through the furnace at a controlled speed, the all-metal Cambridge Belt allows the atmosphere to circulate freely through its open mesh and around the product for fast, thorough treatment.

In heat treating, cleaning or quenching operations, too, Cambridge Belts help maintain capacity production and cut operating costs. Here's how:

CONTINUOUSLY MOVING BELTS ELIMINATE BATCH PROCESSING—give faster, more economical production; reduce manual handling.

ALL-METAL CONSTRUCTION IS HEATPROOF, COLDPROOF, ACIDPROOF—Cambridge belts can be woven from any metal or alloy to take sub-zero or up to 2100° F. temperatures, yet remain impervious to corrosive atmospheres or solutions.

OPEN MESH PROVIDES FREE AIR, LIQUID CIRCULATION—gives more uniform processing of product; grit, sand, quench solutions drain through belt immediately.

SPECIAL SURFACE ATTACHMENTS AVAILABLE—raised edges or cross flights hold product on belt during movement.

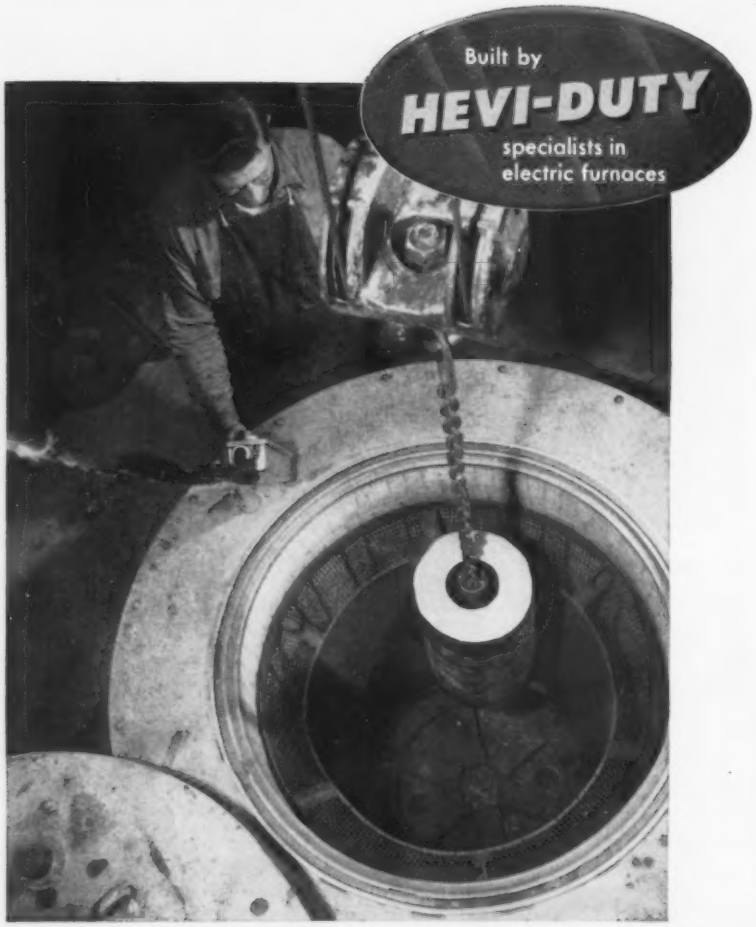
Talk to your Cambridge Field Engineer soon—he'll explain the many advantages of continuous heat treating on Cambridge Woven Wire Belts. He'll recommend the belt size, mesh or weave—and the metal or alloy—best suited to your operations. You'll find his name in the classified phone book under "BELTING, MECHANICAL." Or, write for FREE 130-PAGE REFERENCE MANUAL giving mesh specifications, design information and metallurgical data.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL-MESH CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

Department A, Cambridge 3, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES



Allegheny Ludlum Chose This Pit Furnace ...for top-to-bottom temperature uniformity

Allegheny Ludlum Corporation, Los Angeles, uses this electric pit-type furnace to obtain uniform hardness along the entire length of 42-inch extruding liners and rams. Uniformity over so great an area calls for unusually good furnace performance. That's why they chose a Hevi-Duty furnace.

A temperature check, made at 18 different stations within the furnace, soon confirmed the wisdom of their choice. It revealed a maximum temperature variation of only plus or minus 5°F. Control like this has virtually eliminated rejects and demonstrated once again that *it takes quality to make quality.*

Write for Bulletin 451 for complete details.

- Heat Processing Furnaces
- Dry Type Transformers
- Constant Current Regulators

HEVI-DUTY ELECTRIC CO.
Milwaukee 1, Wisconsin

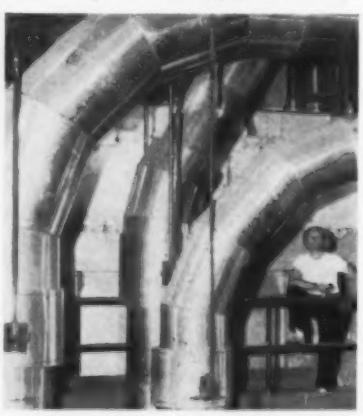
tion of casters, and recommend that users consider: (1) Actual gross operational load capacity required per caster; (2) condition and kind of operating surfaces; (3) speeds of use; and (4) type of use (continuous, intermittent, etc.).

Copies can be obtained directly from caster manufacturers, or from the Caster & Floor Truck Mfrs' Assn., 27 E. Monroe St., Chicago 3, Ill.

Metal Insulation Reflects Heat

Prefabricated thermal insulation of a new type literally bounces heat back to its source. Working on a mirror principle, the all-metal material reflects without absorbing. For use between —400° to +2000°F, it can serve both single and dual-temperature service applications.

Produced by Mirror Insulation Co., Lambertville, N. J., the material can insulate pipes, fittings

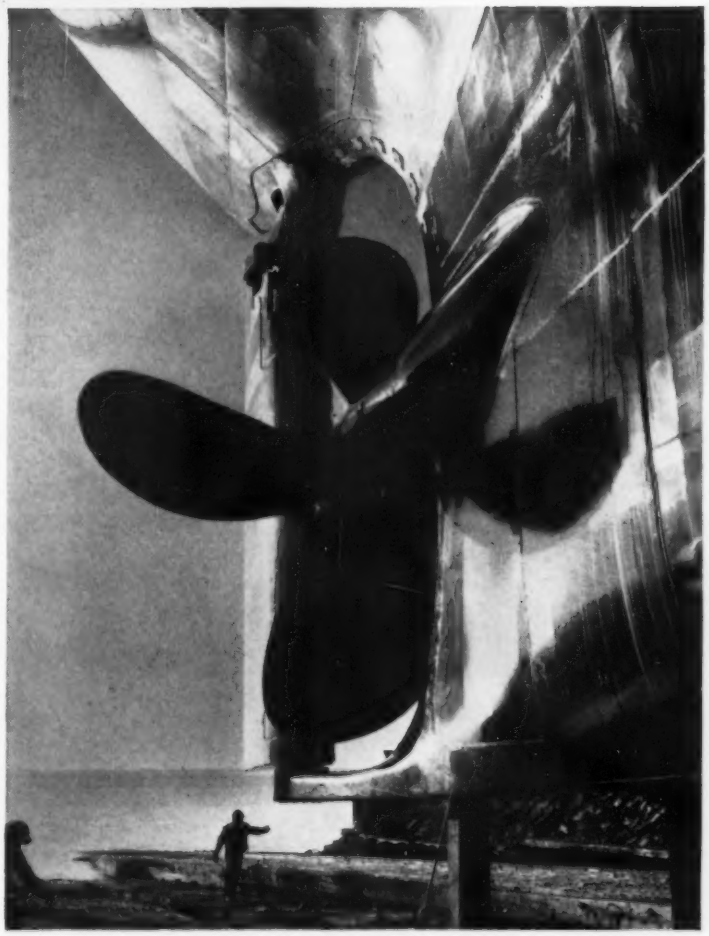


Insulating this piping network is an all-metal system.

vessels, equipment, boiler casings or ducts. It can be used indoors or outdoors.

Metal and Air—Basically, it's made up of air spaces, partitioned by reflective metal sheets. Most of the volume consists of just plain air. This makes it a "mass-less" insulation, having no bulky material to retard the flow of heat. The mirror

Heavy sections like rudder posts and propeller blades can be gamma ray inspected with ⅓ shorter exposure—and welded seams can be radiographed more rapidly with available portable or low kv x-ray equipment—when Kodak Industrial X-ray Film Type KK is used.



. . . cut exposure time 1/3 with New Kodak Industrial X-ray Film

TYPE KK

Where heavier sections are to be radiographed or where the output of available x-ray or gamma ray sources is limited, Kodak's new Industrial X-ray Film Type KK is the film to use.

This film shows as much as 50% increase in speed over the well-known Type K Film. It means more work can be done—that exposures can be cut by a third. And those who have tried Type KK tell us that its higher contrast, offsetting a slight increase in graininess, provides improved radiographic sensitivity.

To learn how Kodak Industrial X-ray Film Type KK can extend the service of your present radiographic equipment, get in touch with your x-ray dealer or Kodak Technical Representative.

EASTMAN KODAK COMPANY
***X-ray Division*, Rochester 4, N.Y.**

Kodak
TRADE MARK

material can be aluminum alloy or stainless steel. An outer casing of heavy-gage metal gives added durability.

Key features of the insulation setup include: non-absorption; sanitary, easy removal and replacement without damage, resistance to vibration and thermal shock, easy to clean.

Induction Heat Unit Anneals Brass, Steel

In manufacturing small arms ammunition, an important process is annealing of cases for subsequent forming. Annealing of the mouth end provides a soft case which may be further formed into the nose of the shell. At the same time, the head of the shell is kept hardened.

For such annealing operations, says G. F. Bobart, Westinghouse Electric Corp., Baltimore, "the induction heating process provides the utmost in both quantity and quality of the finished product."

Units Are Versatile—Westinghouse has developed a package unit for both anneals required in making 30-cal cartridge cases. The machines perform each type anneal on either brass or steel. They are completely interchangeable merely by exchanging the induction heating coil itself.

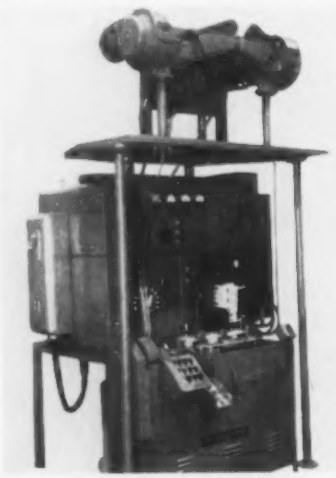
Major components of the installation include the hoppers, conveyor, induction coil, motor starter, voltage regulator, motor-generator set, and the 30-kw heat station.

How It Operates — Cartridge cases feed mouth end up through specially-designed hoppers. They pass through guide tubes to an infeed mechanism on the conveyor unit. Here they are properly oriented into a worm gear; then into fiber rollers fastened to a stainless steel drive chain.

The heads of the cases are submerged in water before, during induction heating, and for approximately five seconds thereafter. This prevents any annealing of the shell head. As cases feed through the induction coil, they constantly rotate to insure perfect uniformity of the annealed pattern around each case and from case to case.

The motor-generator set voltage regulator keeps voltage on the coil constant regardless of fluctuations in line voltage variation or coil loading. This insures uniformity of pattern from case to case whether 1, 2, 3, or 4 hoppers are feeding the machine.

Catches Bent Cases—The unit is set up so that it does not damage either the machine or the induction coil. It also makes sure that only good annealed cases are placed on



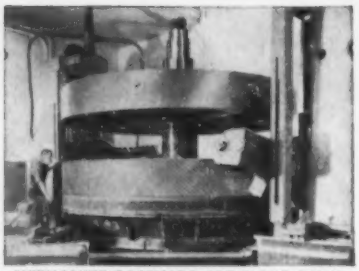
This unit anneals cartridge cases at a 23,000 an hour rate.

the outfeed conveyor. Snubber tubes act as a gauging ring to catch any badly bent or deformed cases as they are fed from the hopper tubes.

Upside down cases which might be accidentally fed down the tubes, are rejected by the infeed worm into a collection basket. Any spoiled cases which pass through the coil without power applied for the full cycle, are rejected to a spoiled case conveyor at the output end.

Speeds Coil Splicing

An automatic welder helps one producer make large copper coils



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Banner Iron Works, St. Louis, Mo.
Barnett Foundry & Machine Co., Irvington, N. J.
Blackmer Pump Co., Grand Rapids, Mich.
E. W. Bliss Co., Canton and Toledo, Ohio and Hastings, Mich.
Centrifugally Cast Products Div., The Shenango Furnace Co., Dover, Ohio
Compton Foundry, Compton, Calif.
Continental Gin Co., Birmingham, Ala.
The Cooper-Bessemer Corp., Mt. Vernon, Ohio and Grove City, Pa.
Crawford & Doherty Foundry Co., Portland, Ore.
Empire Pattern & Foundry Co., Tulsa, Okla. and Bonham, Texas
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General Foundry & Mfg. Co., Flint, Mich.
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Kanawha Manufacturing Co., Charleston, W. Va.
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Lincoln Foundry Corp., Los Angeles, Calif.
Nordberg Manufacturing Co., Milwaukee, Wis. and St. Louis, Mo.
Palmyra Foundry Co., Inc., Palmyra, N. J.
The Henry Perkins Co., Bridgewater, Mass.
Pohlman Foundry Co., Inc., Buffalo, N. Y.
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Ross-Meehan Foundries, Chattanooga, Tenn.
Sonith Industries, Inc., Indianapolis, Ind.
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Valley Iron Works, Inc., St. Paul, Minn.
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Hartley Foundry Div., London Concrete Machinery Co., Ltd., Brantford, Ontario
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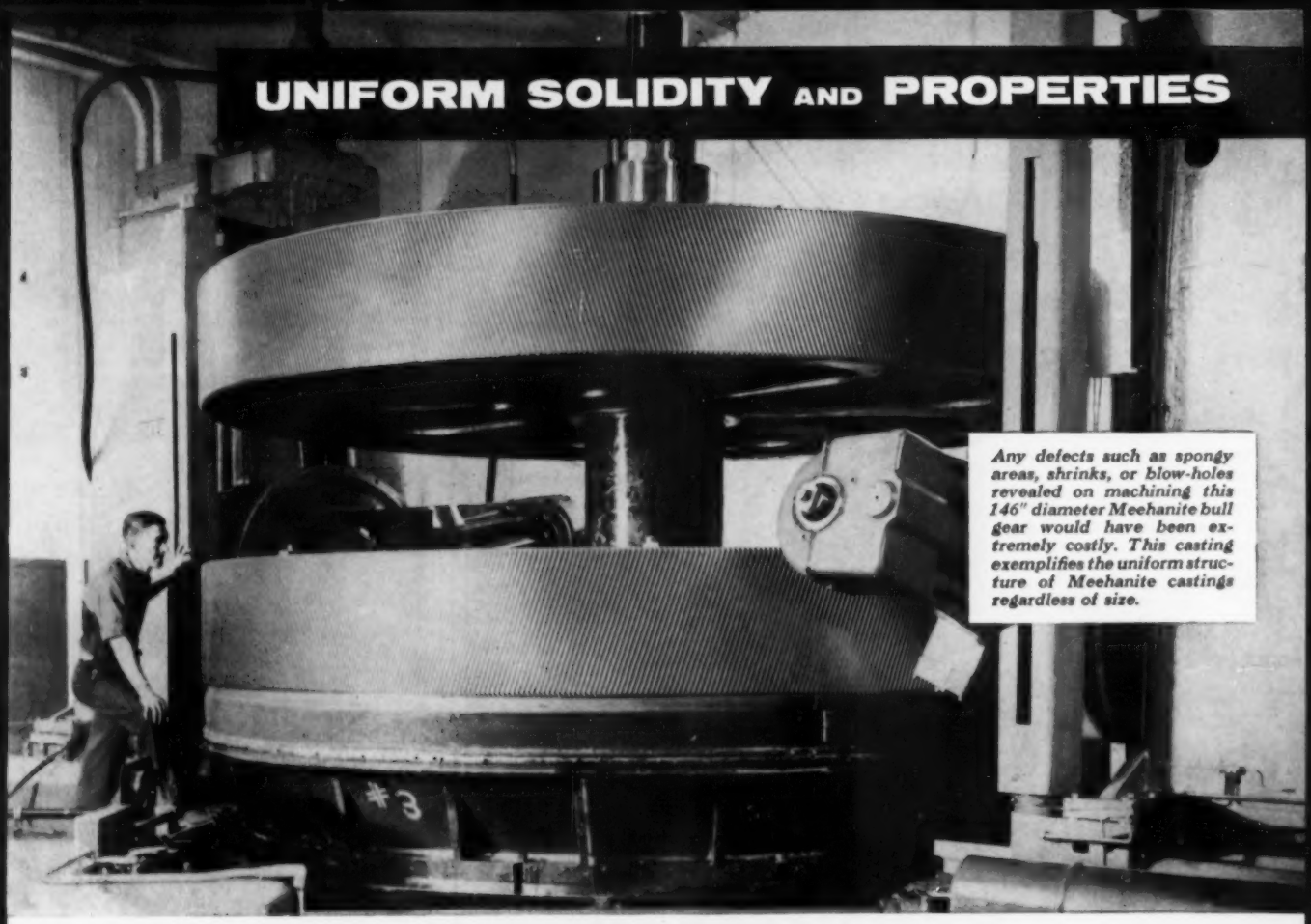
34 PAGES OF USEFUL INFORMATION ABOUT MEEHANITE® AS A GEAR MATERIAL

Write today to Meehanite Metal Corporation, Dept. IA, 714 North Avenue, New Rochelle, N. Y.

MEEHANITE®



Any defects such as spongy areas, shrinks, or blow-holes revealed on machining this 146" diameter Meehanite bull gear would have been extremely costly. This casting exemplifies the uniform structure of Meehanite castings regardless of size.

Uniformly sound Meehanite gears offer high strength, wear resistance and free machinability.

Meehanite metal is one of the most valuable gear materials produced and has replaced steel in many different types of gear applications. It combines the most desirable characteristics of both mild steel and gray iron and wears longer.

Gears made in Meehanite® have uniform physical properties and a fine grain, dense structure free from hidden weaknesses which might lead to premature tooth failures. They possess excellent resistance to wear or to scoring and galling. Freedom from hard spots promotes a high degree of machinability.

Meehanite metal has high tensile strength, high compression and fatigue strength to resist line loading, relatively low notch-sensitivity and self-lubricating properties together with excellent vibration damping qualities which result in smooth quiet operation. Hardness values ranging from 170 to 550 Brinell may be obtained.

For additional information about Meehanite Metal as a gear material write for your free single copy of Bulletin 42 today.

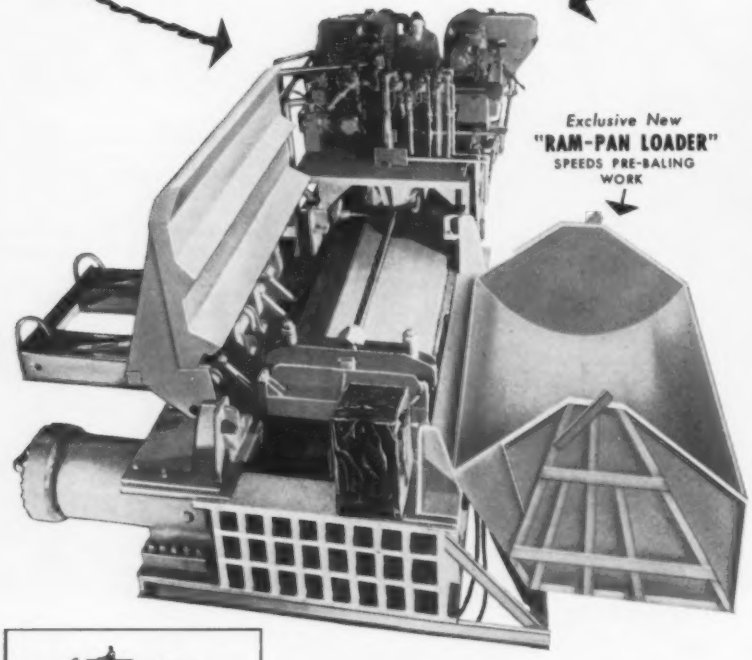
Each type of Meehanite metal is a product of controlled structure. This is a typical microstructure of type GA, Meehanite® showing controlled amounts of graphite in a strong and tough pearlitic matrix. Tensile strength 50,000 psi min; compressive strength 175,000 psi; Modulus Elasticity 20,000,000. Fatigue strength 22,000 psi.

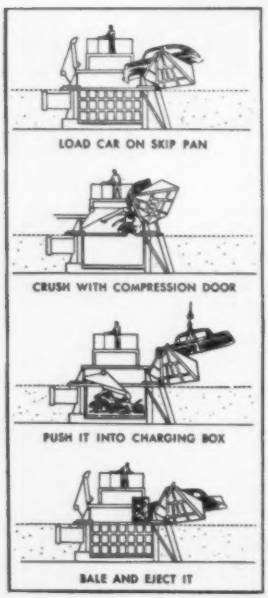
MEEHANITE BRIDGES THE GAP BETWEEN CAST IRON AND STEEL®

MEEHANITE METAL

MEEHANITE METAL CORPORATION, NEW ROCHELLE, NEW YORK

New Power-Packed "750-CS" ... Bales Car Bodies in Just 3 Minutes!





Low-Investment Balester Does Work of Bigger Presses.

In a feast-or-famine market, versatile equipment pays off! That's the reason for the new 750-CS which handles smaller scrap with unbeatable efficiency and bales car bodies at a pace only slightly off that of the big expensive presses. The powerful new "Ram-Pan Loader" with the curved bottom fits the arc of the compression door as it pushes the car down into the charging box, a pre-baling operation that takes less than a minute and reduces costly cutting or shearing work, all told, you've got a tight compact bale in *less than three minutes!* You'll like the many other new features of the 750-CS; write today for our new bulletin.

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WRITE TODAY
For New Bulletin on the 750-CS Dept. IA-3

DEMPSTER BALESTER®

out of small copper coils.

Speeding up production at the Rome, N. Y., plant of Revere Copper & Brass, Inc., the unit handles 99 pct pure copper coils in a fraction of the time required for earlier used hand welding. It's employed

From this control station, the operator oversees the welding.

in line with a leveler, pinch roll stand and side trimmers. The welder unit accepts rolls up to 37½-in. wide before trimming.

How It Works—In operation, the tail end of the lead coil is centered, clamped and sheared. After this the end is swung up out of the way and the lead end of the next coil is prepared in the same way. The entire shear and welding clamp assembly is then moved to the welding position. With the welding clamp securing the sheared, matched joint, the weld is made.

In normal use at Revere, the welder builds one 6000 lb coil out of 2000 lb coils. E. W. Bliss Co., Salem, Ohio, built the machine.

Cuts Trailer Weight

Truckers hauling heavy equipment over rugged mountain country are revising their payload charts with aluminum flatbed trailers. Operators are increasing their payloads by 4000 to 4500 lb and improving their revenues more than 15 pct, with welded aluminum flatbeds. So states Kaiser Aluminum & Chemical Corp., Oakland, Calif., who de-

signed them. Western Oil Tool & Mfg. Co., Inc., Casper, Wyo., builds the trailers.

In addition to payload advantages, the aluminum units demonstrate their sturdiness and stability in what is one of the toughest proving grounds in the nation—the rutted, homemade roads at isolated oil drilling locations, in addition to the poundings they take on mountain roads en route.

Simple Fabrication—The trailer manufacturer produced its first aluminum trailer last winter at a new shop. The unit, a 30-ft rig with a rated load capacity of 55,000 lb, was designed by the Kaiser Aluminum product development department; components were fabricated from two aluminum high-strength, weldable alloys, designated 5083 and 5086.

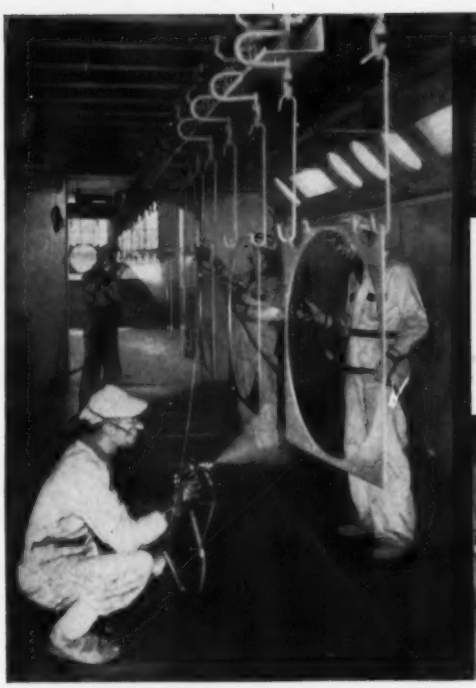
Because of the relative simplicity of the design and the low capital expenditures required to obtain the fabricating equipment, it was possible for the manufacturer to undertake production of this item with no previous experience in forming or welding aluminum.

One Man Handling Cuts Stock Damage

Multiple handling of nonferrous metals has been eliminated by new adjustable storage racks installed in a large midwestern warehouse. And with it out went the all-too-frequent damage to soft nonferrous metals that once plagued the warehouse management.

Meier Brass & Aluminum Co., the warehousing company, became concerned over the comparatively high rate of damage to stock such as copper and aluminum. So it called on Palmer-Shile Co., Detroit materials handling equipment firm, for help. The latter advised installation of adjustable storage racks which did the job.

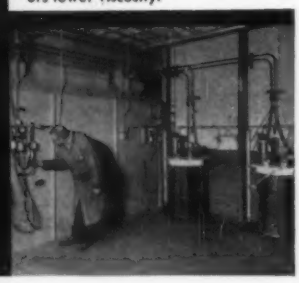
Selection Is Simple—With the new racks, storing and stock selection is now a one man operation.



Above: Metal assemblies start 3-stage phosphatizing operation in the Mayville, Wisc., plant.

Left: With a steady flow of two enamel colors always available, production has doubled.

Below: Binks pumps send enamel to painters. Binks Dualheet heaters lower viscosity.



AT MAYSTEEL, BINKS SPRAY UNITS HELP

boost phosphatizing, priming and painting production by 200%

"Maysteel Products, Inc., makes sheet metal parts and finished products on contract. As part of our expansion program we needed a modern finishing system that would produce quality work on tight schedules. To help us solve the problem, we called in the Binks people," reports Maysteel's president, Mr. C. E. Stryker.

Working with Maysteel, here is the system Binks engineers developed. METAL PREPARATION: A three-stage conveyorized phosphatizing system was developed employing 384 Binks stainless steel spray nozzles. The nozzles completely bathe the metal parts in chemically treated water, wash water and chromic acid rinses. Materials are reclaimed and recycled.

METAL PRIMING: Continuing on the conveyor, parts pass through a drying oven into a 22' water wash spray booth. A Binks circulating system supplies primer to two painters using Binks Model 7 spray guns.

ENAMELING: After another oven drying, the parts are ready for hot-process enameling. Up to five painters using Binks Model 7 spray guns are supplied by a two-color circulating system. Binks Dualheet paint heaters, located just outside the booth, raise the enamel to 140° F. This eliminates the need for thinners and insures full-coat, sag-free coverage in a single pass.

Learn how Binks extensive finishing experience and equipment can be of benefit to you. There is no obligation. Just contact your nearest Binks Branch Office or, if you prefer, write direct to the address below.

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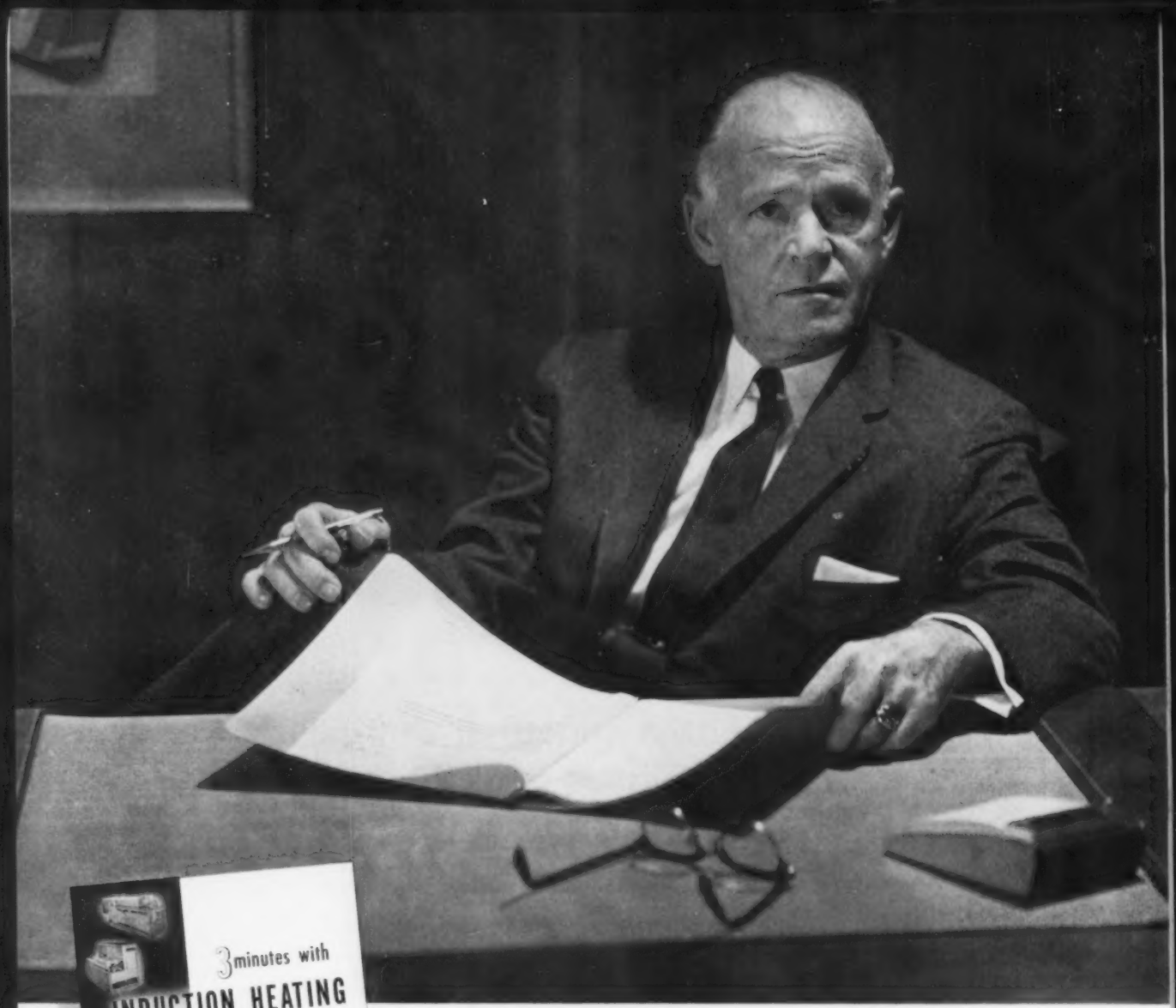

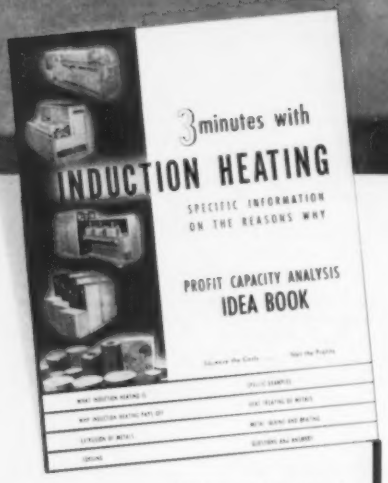

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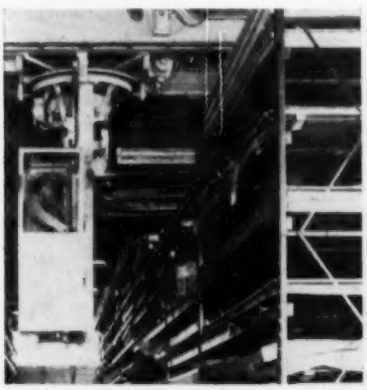
Using a specially designed overhead stacker crane made by All-State Engineering Co., this one man transports all materials directly to a scale for weighing and a shear for cutting. It's done quickly, economically; damage to stock is practically nil.

In addition, reports the warehousing firm, inventory control is greatly



Overhead stacker moves soft metals without harming them.

improved. Handling is much safer. Many new items can be stocked, too.

Racks used are nearly 16-ft high. They can be spaced to any size opening desired for metals in a wide variety of shapes and lengths.

To Discuss H-Energy's Effect on Industry

Latest efforts to harness fusion energy for peaceful uses will be one of the subjects discussed at the Atomic Energy Management Conference to be jointly sponsored by the Atomic Industrial Forum and the National Industrial Conference Board in Chicago on March 17-19.

Joint statements recently issued by the United Kingdom Atomic Energy Authority and the U. S. Atomic Energy Commission revealed that "control of thermonuclear reactions for electricity generation may well be a possibility for the future."

Talk Fission, Too—Highlighting the discussions at the conference

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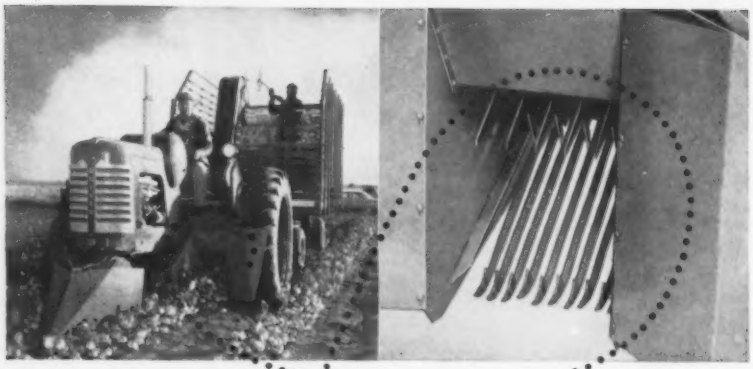

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breakage stopped...
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...all this achieved by Oliver Corporation for one part in their cotton stripper machine

This 30″ tooth and 19 others like it in an Oliver Cotton Harvester, strip the cotton bolls from field plants. It is an unusual casting, only ¾″ thick at the widest point except the mounting shank. Since making it of Malleable Iron, Oliver has saved 82% on the cost of each tooth, or $136.00 per harvester.

The cotton farmer benefits two ways: the tough malleable teeth do not snap off; and the improved mounting method now possible enables him to adjust their spacing for different types of cotton. *None of these malleable teeth, formerly made of another material, have broken in the harvesters built since their adoption.*

How about Malleable?

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TECHNICAL BRIEFS

will be an assessment by a panel of authorities of the timetable for producing controlled thermonuclear power. There will also be an attempt to determine if the rate of progress in this field suggests an expanded or reduced effort on the part of industry in developing and constructing "fission reactors."

The conference will be held in conjunction with the 1958 Nuclear Congress. It has scheduled seventeen round tables for its three-day assembly. Topics will deal with a wide variety of problems confronting industry in its utilization of atomic energy and speakers will present some proposed solutions.

How Much Spending—One panel session will consider whether the billion-dollars-plus which U. S. industry and government have already spent or committed on civilian nuclear development is sufficient to fulfill our objectives of maintaining world leadership in nuclear technology.

Other subjects will include: health and safety, selling nuclear products outside the U. S., are small reactor units economically feasible?, power reactor experience, should the atomic energy act by amended?, outlook for nuclear ship propulsion, market potentials for atomic materials outside the nuclear field, how to develop better products through radioisotopes, reduction of nuclear power costs, materials testing facilities, supply and demand, how the indemnification law is working, potential applications for large sources of radiation, and economics of the reactor fuel cycle.

Fluid Speeds Tapping

A chemically-active, organic compound performs a dual cutting fluid role. It speeds metal removal in production tapping, planing, shaping, and milling operations. And it also retards tool wear.

Produced by United Laboratories, Inc., Huntington, Ind., the

material is a solubilized condensate of sulphur, chlorine, sperm oil and heavy-duty, high-flash paraffin oil. The protracted high-temperature process used in its manufacture is said to produce a material of high lubricity that affords good anti-weld characteristics. Result: little build-up and galling.

Lubricity imparted by the fluid during the relatively slow tapping cycle helps cushion chips which otherwise ride hard on tap flutes. This assures good chip removal. And it helps hold critical thread tolerances.

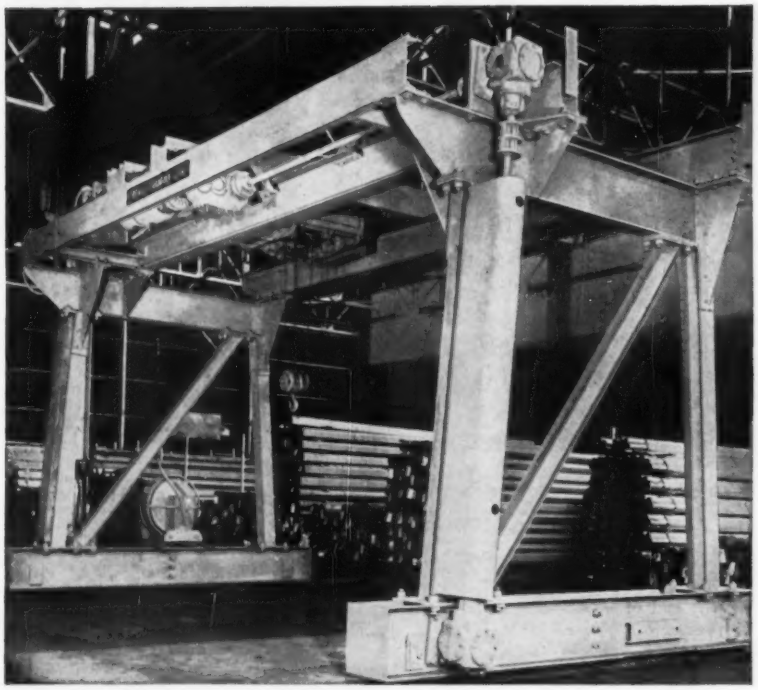
The material also reacts chemically with metal in its semi-plastic state at the point of cut. This action is said to be of a two-step nature involving release of atomic chlorine at temperatures of 270° to 500°F; and sulphur mono-chloride at temperatures beginning at 375°F.

NEW BOOKS

"Welding Handbook (Section One)" is in its fourth edition. Long recognized as the "Bible" of the welding industry, the book is now being published in five sections. One section will be available each year for the next five years. Section One has 420 illustrations and 11 chapters on fundamentals: terms, metallurgy, design, etc. 560 pp. $9 per volume. American Welding Society, 33 W. 39th St., New York 18.

"A Program of Human Engineering Research on the Design of Aircraft Instrument Displays and Controls" has been compiled. 34 pp. Office of Technical Services, Commerce Dept., Washington 25, D. C.

"Vacuum Melting" attempts to be all inclusive. Of course, it isn't. Written in not too technical style, it's a multi-authored report originally prepared for a manufacturing course at Harvard Business School. Much of its substance was supplied by metalworking firms and publica-



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At the modern plant of one of the country's largest aluminum companies, Chicago Tramrail Gantry Cranes handle long extruded pieces from a 14,000-ton extrusion press . . . transfer these pieces to other operations throughout the mill.

Fourteen Chicago Tramrail Full Gantry Cranes provide individual handling equipment for individual operations to eliminate waste time waiting for busy overhead cranes. Designed for heavy-duty, continuous service, these Gantries are built with maximum headroom and maximum clearance between legs to operate independently under the large overhead cranes.

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SPECIAL TWIN RIVITOR! Tooled for 6 station indexing fixture, incorporating automatic clamping and ejecting mechanisms, for riveting laminated armature assemblies.

T-J CLINCHOR adapted to a wide range of clinch nut setting problems. Gravity Feed model shown here.

You'll realize *faster assembly . . . reduced labor costs* immediately, when you use T-J Rivitors and Clinchors for your production line. These performance-proved machines are designed to do a wide range of assembly jobs for aircraft, automotive, farm machinery—riveting jobs of *all* kinds.

T-J RIVITORS automatically feed and set solid rivets with high production. Electrically powered Rivitor sets solid steel rivets up to ⅞" long. Throat depths 8" to 36".

T-J CLINCHORS set clinch nuts with fully automatic operation, controlled by a single foot pedal. Available in Underfeed and Gravity Feed models, throat depths 8" to 36".

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NEW BOOKS

tions. Since its sources rank among the leading experts on vacuum melting, it's only natural that this book is one of the best currently available. Though well-written and well-presented, the entire presentation has a non-expert taste to it (editorially, graphically and metallurgically). However, for the non-specialist metallurgist, executive, educator or student, this book could be plenty helpful. 139 pp. $7.50 per copy. Vacuum Melting Report, 1383 Panther Rd., Rydal, Pa.

"General Galvanizing" is a manual of good practices. Prepared by the Hot Dip Galvanizers Assn., London, it gives credit where credit is due to more modern corrosion preventitives. But, the manual emphatically points out, traditional hot dip galvanizing methods are by no means fully exploited. It states galvanizing's advantages and calls for even further development of new ones. 56 pp. Zinc Development Assn., 34 Berkeley Sq., London W. 1, England.

"Atomic Energy Facts" is devoted entirely to peacetime uses of nuclear energy. Issued by the Atomic Energy Commission, it's a handbook aimed at industrial management. 216 pp. 86 illustrations. $2 per copy. Supt. of Documents, Govt. Printing Office, Washington 25, D. C.

"Dangerous Properties of Industrial Materials," contains nearly 1500 pages on almost every conceivable aspect of industrial safety and hygiene. Although no single volume could possibly present an up-to-date, complete review of the subject, this book is a good, basic reference for anyone working with, handling, or shipping potentially dangerous materials. It is a dictionary of toxics, an encyclopedia, a safety manual, list of government regulations, and textbook rolled into one. But it is not scrambled up, full of crowded text, or hard to read. It's meant for use by chemists.

engineers or non-technical personnel. Quickly and simply, they can look up specific materials, check how dangerous they are, and what precautionary measures to take. Nearly twice the size of the earlier edition, it lists some 8500 materials. 1467 pp. $22.50 per copy. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y.

"Fifty Years of Fuel Testing & Research" is a 15-page booklet. 25¢ per copy. Dept. of Mines & Technical Surveys, Mines Branch, Ottawa, Canada.

"The Industrial pH Handbook" reviews industrial pH control systems, their principles, and application engineering and equipment. 80 pp. $2 per copy. Beckman Instruments, Inc., 2500 Fullerton Rd., Fullerton, Calif.

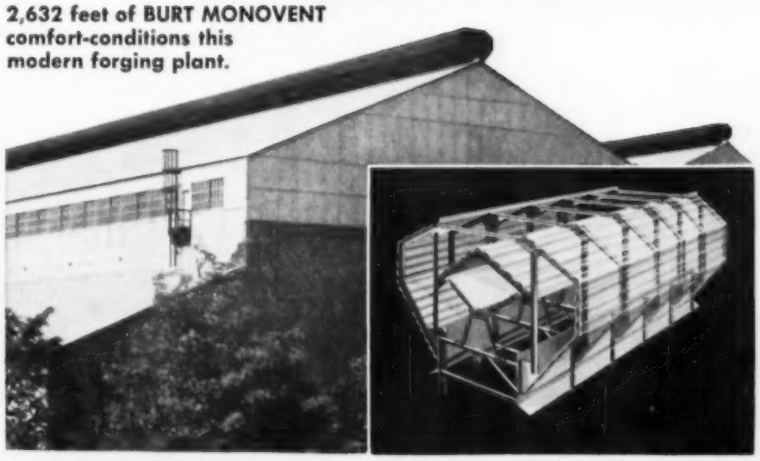
"Estimating Machining Costs" deals with the precision science known to shopmen as educated guesswork. Like many other volumes on the science, it tells how to figure the cost of machining operations so that you won't lose potential profits. But—unlike some books—it doesn't quote cure-all rules. There are some estimating considerations, highly valuable to high-speed drill unit operators, that are as useless to a turret lathe operator as drilling armor plate with a brace and bit is. So the book accepts milling and broaching, eccentric turning and radial drilling as having specific problems with specific answers. 366 pp. $8 per copy. McGraw-Hill Book Co., 330 W. 42nd St., New York 36.

"Tested Techniques of Personnel Selection" presents principles, techniques and procedures for selecting and placement of plant, office, sales, supervisory and executive personnel. It emphasizes importance of keeping square pegs out of round holes, and vice versa. By holding turnover down, you can save maybe $50 a man in the shop; $20,000 in the executive suite. The publication presents some unique

BURT MONOVENT GIVES YOU .....

MORE AIR FOR YOUR MONEY

2,632 feet of BURT MONOVENT comfort-conditions this modern forging plant.



- INSTALLS ON ANY TYPE ROOF
- SIZES FROM 4" to 96"
- STURDY CONSTRUCTION FOR LONG LIFE
- MINIMUM MAINTENANCE

Where high heat or fumes dictate the removal of large volumes of air, the Burt Monovent Continuous Ridge Ventilator exhausts more air per dollar than any other type. It converts the roof ridge into a quick-acting, giant air valve that ventilates the entire structure uniformly by gravity. The Monovent is serving industry economically in continuous runs from one foot to 1,000 feet. It may be *your* best choice too.

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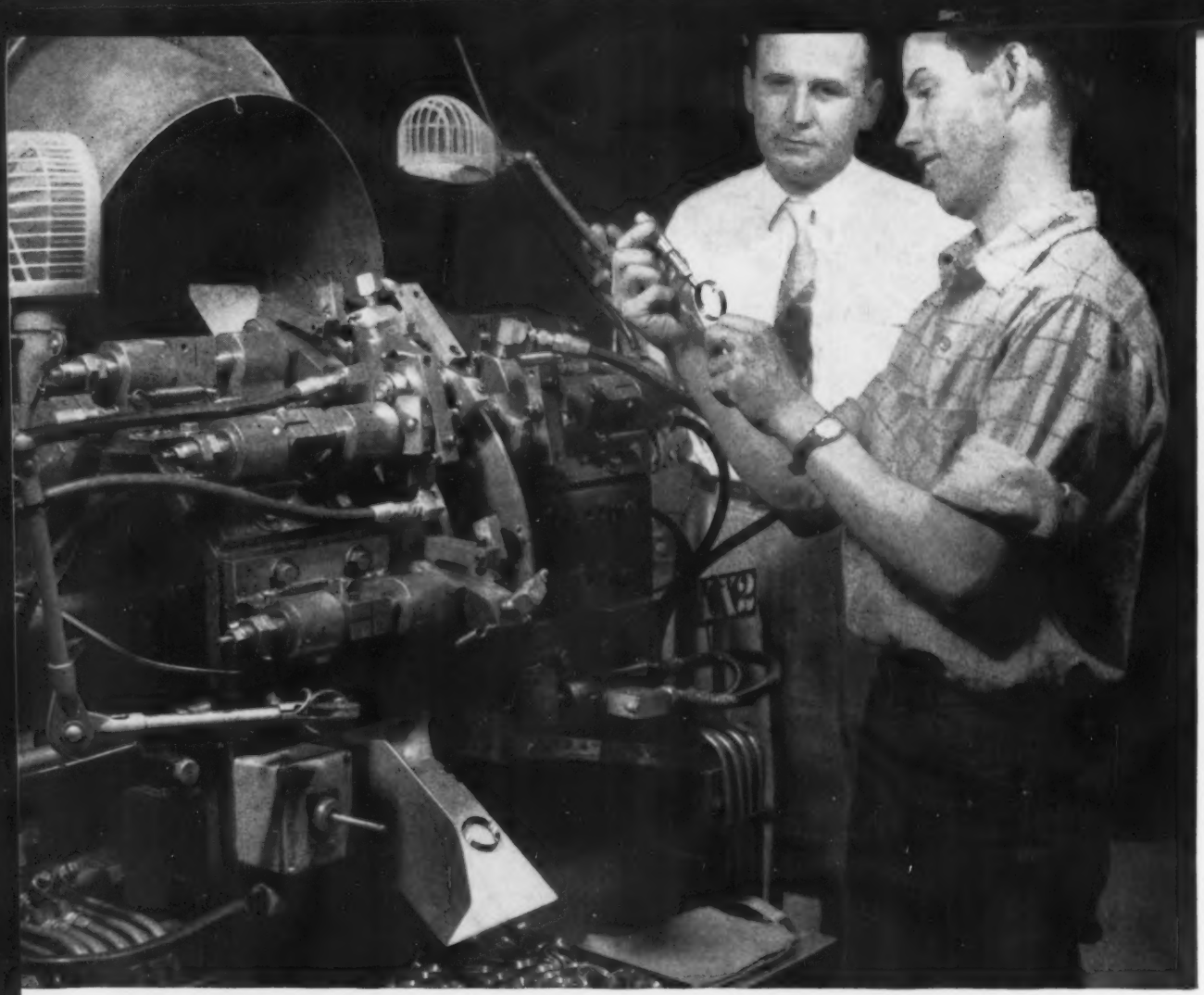
The Burt Manufacturing Company

920 So. High St. Akron II, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION



William Kody, American Coil Spring sales manager, watches as important product receives periodic check. An automobile window regulator clutch spring, it must be very precise. Johnson music spring wire fits product and machine.

Johnson Music Wire meets the test at American Coil Spring Company where . . .

Automation Demands Uniform High Quality

When American Coil Spring Company needed a precise music spring wire for an exacting auto window regulator spring, past experience prompted it to turn to Johnson Steel & Wire Company, a leading producer of high-carbon fine-specialty wires.

And when the same company—for 32 years one of the nation's top precision springmakers—was looking for ways to further automate its Muskegon, Mich., plant, Johnson came up with another answer—extra-sized coils of weld-free music wire to reduce machine downtime and wire handling.

One of the largest spring wire users in the United States, American Coil has a company watchword—Springs With a Pedigree. Everyone at American Coil lives up to this slogan by constantly emphasizing quality in every phase of production. This has paid off for American Coil by building a reputation for making the best of standard springs—and special springs others can't make.

Every bit of American Coil's skill comes into play on the auto window regulator spring. The spring has to have perfect diameter because it is mechanically inserted in the window clutch during an automatic assembly. Too large, and the spring won't fit. Too small, and it will cause slippage when the window is raised or lowered. Either variation in dimension will cause rejection.

To make the spring, which has three turns and is close wound with extended legs bent opposite, American Coil invented a special machine to combine the coiling and bending operations.

One-half of the challenge solved by the machine, American Coil then had to find a superior wire. Cast and peak had to be exactly as specified. Uniform dimension of .055″ X-L-O music wire had to be held, both within the coil and from coil to coil. Excellent surface was another must. Johnson's X-L-O music wire met these specifications readily. It is available in a full range of sizes between .003″ and .300″ and can be given a number of phosphate or other surface coatings.

Meeting this customer's requirements through ingenuity and good wire is a formula American Coil applied in the case of the extra-sized coils.

Springs are periodically projected onto the screen of this shadowgraph so that minute details of their conformation are compared with drawings.

Operator prepares for a run of springs for automatic bowling alley pin setters. The Johnson music spring wire that feeds this machine comes in a special 500 lb. bundle so that run will be twice as long. Downtime is reduced.

American Coil is committed to a policy of automating wherever possible. In springs requiring Johnson's .080" and larger music wire, Johnson doubled coil sizes from the traditional 250 pounds to 500 pounds without welds. This reduced storage space, simplified handling and reduced downtime on the coiling machines. Moves like this permit American Coil to achieve a daily capacity of 18 million pieces with a labor force that numbers usually 350 people.

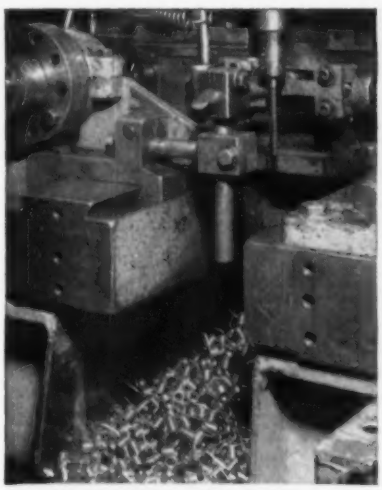
Of the relationship between American Coil and Johnson, Works Engineer James Church of American Coil says:

"The combination of our experience in springmaking and Johnson's superior knowledge of wiremaking, results in a highly successful product."

All these advantages of Johnson's wire are available to you, no matter whether you need music wire or any of the other specialties—

Aircraft Cord Wire . . Armature Binding Wire . . . Belt Hook Wire . . . Bobby Pin Wire . . . Brush Wire . . . Gutterbroom Wire . . . Card Wire . . . Shade Roller Wire . . . Flexible Shaft Wire . . . Heddle Wire . . . Hose Reinforcement Wire . . . Hose Wire . . . Mandolin Wire . . . Piano Wire . . . Rope Wire . . . Safety Pin Wire . . . Special Shaped Wire . . . Staple Wire . . . Metal Stitching Wire . . . Signal Corps Wire . . . MB Spring Wire . . . Tire Bead Wire.

If you have an application which requires high quality and close tolerances, Johnson is ready to serve you. Call your closest district office today.



Nobody watches this machine as it produces thousands of perfectly duplicated springs. If the wire were not highly accurate in dimension and metallurgical characteristics, frequent adjustments would be necessary.

Testing for tension is a constant operation at American Coil Spring. Variations in wire quality would show up here. American is well satisfied with Johnson music wire quality.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

***a subsidiary of* Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

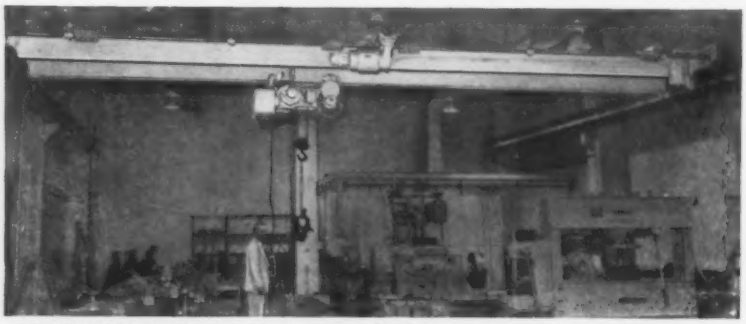
Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

SHEPARD NILES

SINGLE BEAM CRANES

WHICH CRANE

. . . Over-running or Under-running?

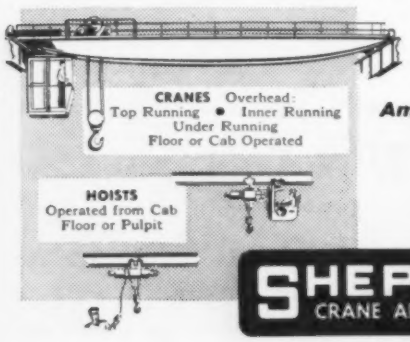


OVER-RUNNING where double beam cranes are not practical or for auxiliary service.

UNDER-RUNNING . . . for limited clearances . . . operating on runways hung from roof trusses!

Cut costly ground level handling. Move loads smoothly and safely overhead with Shepard Niles single beam cranes. Operate from floor or remote location. Push type or motor driven trolley type hoists, including close clearance units.

Send for Single Beam Crane bulletins today . . . or ask that a Shepard Niles representative call — there's NO OBLIGATION.



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Since 1903

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NEW BOOKS

ways to do this, including sample personnel forms. Whether these forms offer the book's only major weak points is up to the reader to decide. Certainly it's debatable whether bold inqueries can lose a good employee before he was hired. Samples: "How do you and your wife get along?" "Entertain at home?" "When did you have last drink?" "What types of people rub you the wrong way?" To the latter, a prospective key man might find his answer includes over-paternal, nosey personnel managers. 333 pp. $20 per copy. The Dartnell Corp., Ravenswood & Leland Aves., Chicago 40, Ill.

"Screw-Thread Standards for Federal Services" have been ammended and re-issued by the National Bureau of Standards in its latest handbook (H28, 1957, Part 1). This is the first of three volumes telling what uniform standards must be met by screw-threads used by Federal agencies. Supt. of Documents, Govt. Printing Office, Washington 25, D. C.

"Concise Guide to Plastics," by H. R. Simonds, answers practical questions about properties, uses, costs and sources of all known commercial American plastics, including some still in the laboratory stage. It supplies basic data on properties, forms available, and current methods by which the materials are worked. Future trends are also discussed. 318 pp, $6.95. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y.

"Columbium & Tantalum" discusses the worldwide mining of ore, milling of it, and end-product development. 56 pp. 50¢ per copy. Mines Branch, Dept. of Mines & Technical Surveys, Ottawa, Canada.

"Automation in Practice" by S. E. Rusinoff, M.E. Prof., Illinois Institute of Technology, surveys up-to-date automatic production techniques. It particularly concerns

metalworking setups. Although many books tackle automation, few deal with actual production processes as this one does. And it's about time, too, that authors climbed down off their high technical horses to explain practical applied automation in English to busy management and engineering men. 261 pp. $6.50 per copy. American Technical Society, 848 E. 58th St., Chicago 37, Ill.

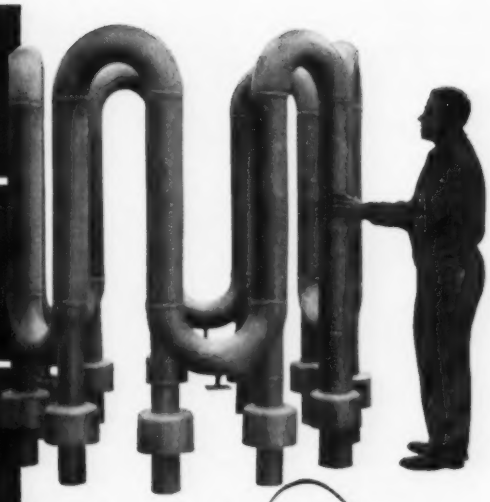
"Engineered Work Measurement" uses several thousand well-chosen words and 120 illustrations to tell the story of methods-time measurement. MTM, an international predetermined time and motion study, is explained historically, fundamentally, mathematically, and scientifically. Applications and standards are covered. Tables and an MTM working-data card for on-the-job use are included. 630 pp. $12 per copy. The Industrial Press, 93 Worth St., New York 13.

"Creep & Fracture of Metals at High Temperatures" contains 22 papers presented at an international conference. The contributors left out nothing they consider of scientific significance. Thus the book literally abounds with theories, ideas and test reports on the creep of metals when subject to stress at high temperatures. 419 pp. $12 per copy. Philosophical Library, 15 E. 40th St., New York 16.

"Judicial Economics" makes interesting reading for businessmen. For it deals with the doctrine of monopoly as set forth by Federal judges deciding anti-trust suits. After discussing the psychology of anti-monopoly thinking, the pocket-sized, hard-bound work virtually puts the subject under a microscope. As stated by the author himself, such writing requires "irksome effort." Reading it takes "effort almost as irksome though commonly less prolonged." But it's effort well-spent. 175 pp. $1 per copy. Ambrose Pare Winston, 4601 Horseshoe Bend, Austin, Tex.

DURALOY

DURASPUN



An Example of Duraloy TRIPLE Service

DURASHEL

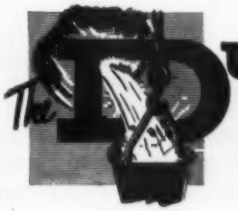
This photograph of an 'immersion type radiant heater shows a welded assembly of:

1—static castings (collars)
2—centrifugal castings (straight pipe sections)
3—shell molded castings (bends)

This unit provides an excellent example of our broad TRIPLE Service.

Our experience in static high alloy castings began in 1922; in centrifugal castings, in 1933; in shell molded castings, in 1955. Thus, in this radiant heater, the old blends with the new. It's an excellent example of the kind of work we do.

If you want your high alloy castings alloyed by specifically experienced metallurgists and cast by specifically experienced foundry men . . . those who work exclusively along these lines . . . Duraloy should be your choice.



The DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.
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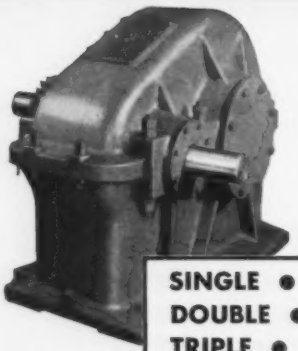
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

Continuous Tooth

HERRINGBONE GEAR SPEED REDUCER



SINGLE •
DOUBLE •
TRIPLE •
REDUCTION

The Gear with the Backbone •

Proven On-the-Job Advantages of This Type of Gear Reduction

1. No side thrusts, avoidable deflections, distortions, impact stresses.
2. Stronger teeth, due to archlike construction.
3. Greater load carrying capacity.
4. More silent and smoother gear action.
5. Uniform load across face due to balanced thrusts of opposing helices.
6. Better lubrication, due to wedge action of teeth.
7. Overall design makes it less costly to produce.
8. Can be substituted for straight tooth gears.

We have extensive facilities for making Herringbone Gears, producing them from 1" to 60" in diameter, 16 DP to 1½ DP and up to a 20" face.

YOUR GEAR INQUIRIES WILL RECEIVE PROMPT ATTENTION FROM US.

SEND FOR CATALOG 40

ESTABLISHED 1888

D. O. James

D. O. JAMES GEAR MANUFACTURING CO.
1140 W. Monroe Street, Chicago 7, Ill.

Steel Compound Cuts Tooling Costs

In making punch and die sets for short-run drawing, one fabricator has slashed tooling costs 85 pct.

Making this possible is a new steel and epoxy-type resin compound.

▪ A tooling compound that has cut up to 85 pct from time and material costs involved in toolmaking for metal-forming consists of steel and epoxy-type resin. The punch-and-die material is designed for use in place of expensive machined metal tools for prototype or short-run draws of difficult shapes.

In simpler metal-forming, tools made of the compound can be used for production runs in the thousands of pieces, says its developer, Minnesota Mining & Mfg. Co., St. Paul, Minn. Such tools also have been employed successfully for corner-ironing and complex contours having double draws.

Slashes Fabrication Costs—Recently, a large custom fabricator of metal parts used the compound. It reduced by 18 elapsed days (from 21 to 3) and by $621 (from $730 to $109) the time and money it would have cost to make a punch and die for a cable splice with conventional tooling.

The splice was about 6-in. long and 2-in. wide. It included some circular and double draws up to ⅞-in. deep. About 2000 pieces were needed, drawn from 0.036-in. cold rolled steel.

Speeds Work Time — Starting with the finished wood and plaster patterns, the punch and die were made, finished, machined and drilled, and tapped for mounting in only 4.8 man-hours of labor over the course of three normal working days. Compare this with promise of delivery of a conventional tool in three weeks, excluding the machining necessary for mounting.

The machining operation employed with the compound used magnetic chucks and ordinary machine tools without modification. Punch and die were bolted onto a 45-ton Bliss press in the same manner as machined steel tools are mounted. Using no frame or box, they were operated at a rate of 300 pieces an hour continuously for a 4-hour run of 1200 pieces.

Operator draws 0.036-in. cold rolled steel with the dies.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 135. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Could Up This Rate—This rate could have been increased to 600 pieces an hour, if necessary, according to the fabricator. But it was reduced so that one operator could handle both blank greasing and press operation.

Tool wear after the run was negligible; considerable additional production is expected.

The tooling compound is more than 90 pct steel. This gives it compression strength (22-26,000 psi), impact strength (0.4 ft lb/in. of notch), abrasive resistance, and machineability necessary for standard press set-up and running operations.

Etches Aluminum

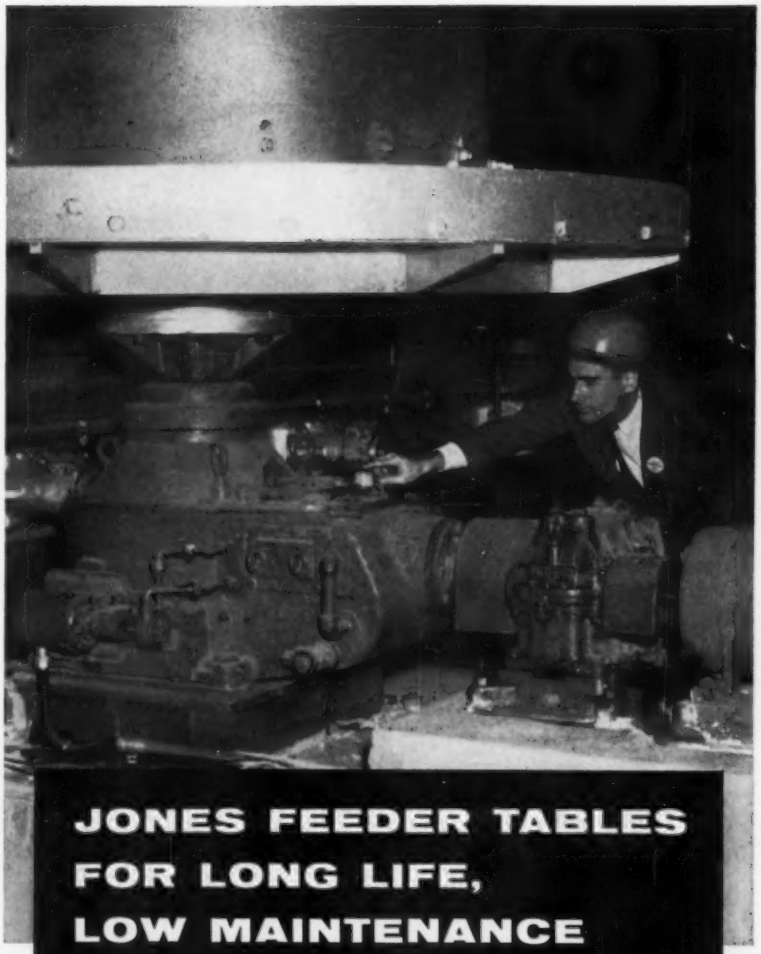
After two years of research and development, American Chemical Paint Co., Ambler, Pa., announces a new aluminum etchant. It's specifically designed to insure a consistently uniform etch pattern and etch rate without scale build-up on tanks and coils. These advantages are independent of the aluminum concentration in the bath.

Strips Thick Coatings

All types of varnish, in practically any toughness and coating thickness can be stripped quickly and easily with a nonflammable impregnating varnish remover. A product of London Chemical Co., Melrose Park, Ill., the remover strips clean accumulations up to 2-in. thick in five hours or less. It works equally well with air-dried or baked varnishes, regardless of baking temperature.

Resin Coats Metals

A new polyvinyl chloride dispersion resin has been developed for plastisol and organosol applications. Introduced by Goodyear Tire & Rubber Co., Akron, Ohio, the new resin exhibits good electrical properties and viscosity stability characteristics. It contains only minor fractions of nonpolymer. It's not a spray dried product. In addi-



This Hewitt-Robins Jones feeder table at United States Steel's Fairless Works provides a uniform supply of sinter fines from an overhead hopper to an H-R vibrating conveyor. The table is mounted directly on the output shaft of a Jones right angle reducer driven by a Jones heavy duty herringbone unit.

Over the past 25 years, the hundreds of Jones feeder table installations have averaged only 68¢ per year per unit for spare parts. This remarkable record of trouble-free operation is the result of Jones' long experience with all principal types of feeder table drives—experience that you can call upon for the right type of feeder table gearing to meet your specific needs. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

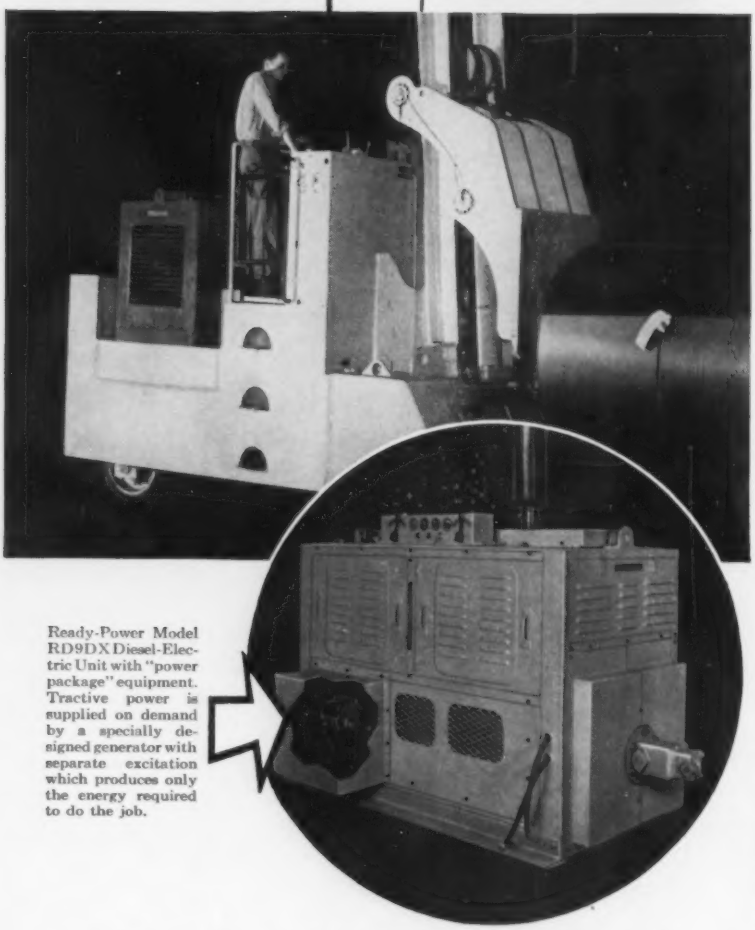
HR HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS... POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE... VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

New Diesel-Electric "Power Package" Does Both Jobs Economically

1 GENERATES TRUCK MOTIVE POWER

2 DIRECT-DRIVES HYDRAULIC PUMP



Ready-Power Model RD9DX Diesel-Electric Unit with "power package" equipment. Tractive power is supplied on demand by a specially designed generator with separate excitation which produces only the energy required to do the job.

Ready-Power makes diesel-electric power doubly effective with a newly developed "power package" designed specifically for use with its "RD" Series Power Units. This remarkable new concept allows the unit to operate at *constant speed*, no load to full load, yet supplies full range of tractive power on demand and produces continuous hydraulic power without need for intermediate electric motors. The last word in simplicity, this new "power package" eliminates contactor failure, minimizes maintenance, assures maximum operating economy for electric trucks up to 200,000 lb. capacities. Write for complete information.

READY-POWER

The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electic Power Units for Industrial Trucks

tion to such electrical applications, other uses could include decorative and protective metal coatings and hot and cold dip compounds.

Metal coatings based on the material are easily spread or spray-applied. Small additions of it furnish fine pick-up properties to dipping compounds.

Sinters Titanium

Sintered titanium parts are now available in a wide range of types and sizes, in high volume, to close tolerances. While the producer, Keystone Carbon Co., St. Marys Pa., places current emphasis on smaller parts such as bearings, cams and gears, much larger elements can be manufactured. The company is also taking special interest in controlled-density powdered titanium filters for gases and liquids.

Protects Surfaces

Petroleum - base rust preventives have proved effective in providing temporary protection for machined surfaces, particularly those subject to sliding contact. So states a leaflet recently issued by the Small Business Administration. It points out these rust preventives form a flexible coating that does not crack during the expansion and contraction of the metal. The coating gives full surface protection and often does not require removal. Practically all of these rust preventives are lubricants in their own right and are compatible with other lubricants.

Tetrafluoromethane

Tetrafluoromethane (carbon tetrafluoride CF_4) is now being offered for research purposes by Matheson Co., Inc., East Rutherford, N. J. The gas comes in three cylinder sizes at a cylinder pressure of approximately 500 psig. Minimum purity is 95 pct.

Which of these did you use today?

Alarm wake you this morning? Stove timer work all right? Did you drive to work . . . take a business trip by air . . . press a light switch . . . use a dictating machine . . . or home workshop motor? Then you, or someone in your home or business, used a spring. With a product-mix like this it's practically certain that we enter your daily living, tucked anonymously away in nationally known and respected brands of all sorts of articles.

Write for a copy of "How to Solve Your Spring Design Problems" to learn how early consultation with the spring manufacturer results in improved design and performance.

Associated Spring Corporation

General Offices: Bristol, Connecticut

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y.
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Wallace Barnes Steel Division, Bristol, Conn.

Canadian Subsidiary: The Wallace Barnes Co., Ltd., Hamilton, Ontario and Montreal, Quebec

5804 © 1958 ASSOCIATED SPRING CORPORATION

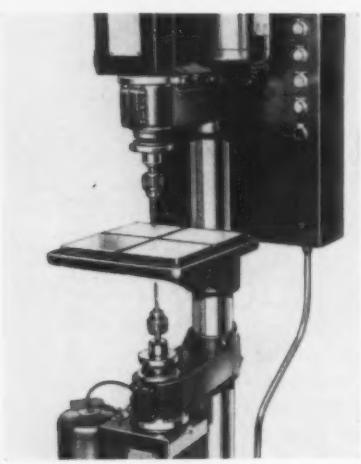
New Production Ideas

Equipment, Methods and Services

Ultrasonic Gage Fits Into Automated Lines

Self-contained, this ultrasonic gage fits into automated production lines. It affords these lines a means of thickness gaging, recording, and detection of laminar flaws. It includes connections for automatic sorting and rejection. The rack-mounted ultrasonic quality-control unit is comprised of ultrasonic resonance gaging and indicating circuitry, a strip chart recorder, gating and alarm circuits, and calibration control. The 225-lb unit measures 21 x 24 x 68-in. high. Power input at 60-cycle, 100 to 130-v alternating current is 500 w. For special requirements, 220-v, 50-cycle equipment is available. Thickness of metals and other materials between 0.05 and 2.5 in. can be measured. Readings are obtained instantly by applying a transducer to one side of the work and reading the thickness indication. (Branson Instruments, Inc.)

For more data circle No. 41 on postcard, p. 135



Machine Drills, Spot Faces, Taps, Reams, Etc.

Deburring, chamfering, spot facing, drilling, and/or tapping, reaming and other related machining operations are possible individually, simultaneously, or in sequence with this automatic machine. Designed for opposed operation, it can operate with a small index table, manual or air clamp fixtures, hopper or vibration feed. It's also recommended for deburring or chamfering both sides of holes in thin sections. Fixtures or tooling locate quickly and accurately in precision machined cross-slots on the table. The machine has two automatic drill units; these have a ⅜-in. drilling capacity; tapping capacity is ½-13 in. mild steel at 10 speeds from 400 to 7420 rpm by interchanging pulley combinations. Controlled feed range is up to 60 ipm, while the rapid approach rate is 600 ipm, and the return rate 300 ipm. Maximum spindle stroke of each unit is 3 in. (R. E. Ellis Engineering Co.)

For more data circle No. 42 on postcard, p. 135

Fork Lift Truck Has A 30,000-lb Capacity

This heavy-duty fork lift truck will handle heavy loads while rolling over unpaved areas or inside plants. The lift truck keeps its 30,000-lb capacity at all working speeds. Its forks can be hydraulically extended 4-ft forward at any mast height. Forks that tilt independently of the mast are another important feature of the truck. Maximum tilt-up is 15°; maximum down-tilt is 73°. All movements of the materials handler are actuated by smooth acting hydraulic controls. Lift cylinders are equipped with a hydraulic accumulator to absorb shocks and ease operator fatigue. A hydraulically extended counterweight is controlled from the cab. The truck uses a GMC diesel engine, power shift transmission. (Pettibone Mulliken Corp.)

For more data circle No. 43 on postcard, p. 135

(Advertisement)

Special Reports On Finishing Non-Ferrous Metals

NUMBER II—Paint Base, Corrosion-Resistant Finishing with Iridite

WHAT IS IRIDITE®?

Briefly, Iridite is the tradename for a specialized line of chromate conversion finishes. They are generally applied by dip, some by brush or spray, at or near room temperature, with automatic equipment or manual finishing facilities. During application, a chemical reaction occurs that produces a thin (.00002" max.) gel-like, complex chromate film of a non-porous nature on the surface of the metal. This film is an integral part of the metal itself, thus cannot flake, chip or peel. No special equipment, exhaust systems or specially trained personnel are required.

Chromate conversion coatings are well known and accepted throughout industry as an economical means of providing corrosion protection, a good paint base and decorative finishes for non-ferrous metals. However, continued developments have been so rapid and widespread that many manufacturers may not be completely aware of the breadth of application of this type of finish. Hence, this digest of current information; to bring you up to date on the many ways in which you can obtain proper surface preparation for painting and increase product durability with a single multi-purpose chemical pretreatment. Report I on decorative, corrosion-resistant finishes and Report III on chemically polished, corrosion-resistant finishes are available on request.

First, it is an accepted fact that metal surfaces should be prepared before painting to make possible an efficient paint system. Naturally, this preparation should provide for good initial paint adhesion. Chemical treatments have proved extremely effective in this respect, particularly those of a neutral or preferably acid nature. Further, to be most efficient, chemical treatments should provide a non-porous barrier to maintain adhesion by sealing the metal from the paint and moisture. They should also provide a self-healing film which prevents lateral corrosion in the event that bare metal is exposed through scratching.

The Iridite chromate conversion coatings meet all these requirements. Iridite is a chemical conversion treatment for surface preparation. It provides initial paint bonding by molecular adhesion. It is acid in nature and produces a film that is gel-like and non-porous in structure. Thus, the Iridite film effectively seals the metal from the paint and from moisture penetration. Because the film contains certain relatively soluble constituents, it will protect areas scratched through to bare metal and prevent lateral corrosion. This is accomplished by a gradual leaching of these constituents into the damaged area.

Further, because of its gel-like, non-crystalline nature, the Iridite film will not affect the appearance or texture of the paint film, nor will it dust or powder to mar the painted surface. Because the film is non-porous, paint coverage is increased, thus substantial savings in paint costs will be realized. In addition, treated parts may be stored for long periods of time prior to painting without the risk of entrapped moisture causing blistering when painting.

Iridite chromate conversion coatings are widely used with equal ease and success under both baked and air-dried paint systems. While the actual adherence properties of the Iridite film do not increase appreciably with its thickness, corrosion protection does. The protection of the Iridite film is proportionate to its thickness and should be taken into consideration when selecting the Iridite to meet your needs. However, it is sometimes necessary to sacrifice maximum corrosion protection for appearance when a finished part is to be only partially painted. For example, it may be desirable to use a thin, clear, bright Iridite film if the unpainted areas must present a chrome-like appearance. A typical case is that of instrument housings on which the exterior is painted and the inside left unpainted.

On the other hand, if all surfaces of the product are to be painted and maximum corrosion protection is required, the heavier and most protective Iridite films should be used. For example, all surfaces of zinc die cast fruit juicers are finished with a highly protective Iridite film prior to painting to provide maximum resistance to the corrosive action of fruit juices.

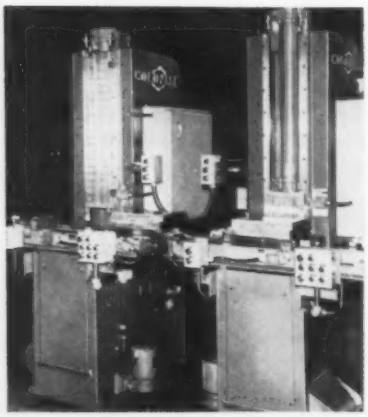
Iridite finishes are now available for all commercial forms of the more commonly used non-ferrous metals, including zinc, cadmium, aluminum, magnesium, silver, copper, brass and bronze. In addition to providing an excellent base for paint, the Iridite films also have high decorative value when used as final finishes in themselves.

These films can produce a wide variety of pleasing appearances including clear bright, iridescent yellow, bronze, olive drab and brown. In addition, many films can be modified by bleaching or by dyeing. Among the dye colors available are various shades of red, yellow, green, blue or black.

In planning or designing, you should consider the many other characteristics of Iridite finishes which may enter into the specific problem. In addition to their functions as protective and decorative finishes, and as bases for organic finishes and bonding compounds, Iridites have low electrical resistance. Some can be soldered and welded. The film does not affect the dimensional stability of close tolerance parts.

Iridites are widely approved under both Armed Services and industrial specifications because of performance, low cost and savings of materials and equipment.

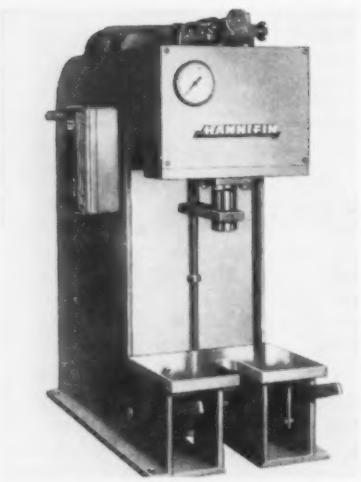
You can see then, that with the many factors to be considered, selection of the Iridite best suited to your product requires the services of a specialist. That's why Allied maintains a staff of competent Field Engineers—to help you select the Iridite to make your installation most efficient in improving the quality of your product. You'll find your Allied Field Engineer listed under "Plating Supplies" in your classified telephone book. Or, write direct and tell us your problem. Complete literature and data, as well as sample part processing, is available. Allied Research Products, Inc., 4004-06 East Monument Street, Baltimore 5, Maryland.



Paired Broaching Machines Work As One Unit

Rapid, economical production of small parts is performed by this broaching machine combine. It encompasses two standard ram-press broaching machines mounted side-by-side. The pair of 4-ton, 42-in. models form a single unit that lets one operator work both machines. The team performs surface broaching, internal push broaching, internal pull broaching and press work. In this new setup, physical relationship of the two machines with each other is held by the mounting installation. The machines are electrically interlocked. Mutual fixturing and controls allow each setup to operate on a semi-automatic machining cycle. There's no time lost as the operator loads one machine while the other is broaching. This dual setup is available with all models up to the 10-ton one. (Colonial Broach & Machine Co.)

For more data circle No. 44 on postcard



Press Forms, Trims, Force-Fits Workpieces

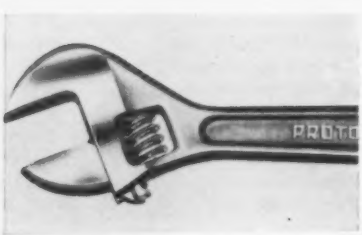
Especially designed for forming, trimming and force-fit assembly operations is this high-speed bench press. Dual hand control and adjustable down-stroke control are standard on the new press. It comes with electric pushbutton controls with or without pressure reversal as optional features. Return stroke is adjustable in all models. This permits shortening the work cycle to where the ram just clears the workpiece on repetitive operations. Tonnage is also adjustable, from 10 pct of capacity to full rated capacity. The press stands 39 in. above the bench or other surface on which it's used—on a 17 x 30-in. base plate. It can also fit onto a matching steel base for floor mounting. Stroke is 6 in. Reach from throat of frame to centerline of ram is 6 in. Daylight is 12 in. The removable table is 14½-in. wide x 10-in. deep; its top is 8¼ in. above the mounting surface. (Hannifin Co., div. of Parker-Hannifin Corp.)

For more data circle No. 45 on postcard

Dump Bucket Scoops Handle Bulk Materials

Hydraulic and mechanical dump bucket scoops now available handle most bulk materials with ease. Now offered as optional on one maker's electric fork lift trucks, the scoops will transport sand, chemicals, coal, small castings, stampings, etc. In either 5 or 10 cu ft capacities, they are operated from controls located inside the truck's driving compartment. Materials are held in the scoops by tilting them to their 30° maximum upward tilt. Maximum downward tilt is 45° which allows materials inside to be completely dumped. A double-acting hydraulic cylinder assures safe, reliable operation of the scoop. (Lewis - Shepard Products).

For more data circle No. 46 on postcard



Turning the Knurl Adjusts, Locks Wrench

This wrench is known as an "automatic adjustable." It requires no adjustment other than simply turning the knurl as in the case of an ordinary adjustable wrench. There are no levers, no buttons. As the knurl is turned, jaw openings are held fast, can't change position. The tool is forged from fine alloy steel. Each wrench is highly polished and then chrome plated to prevent rust. Absence of a corner lip on the

Three-time ABC winner, famous bowler BILL LILLARD slams in strike after strike sending ball and pins flying against piece of TI-CO set up in pit. Close up examination by Bill shows plenty of punishment but no flaking. TI-CO's zinc coating rolled with the punch!

BOWLING CHAMP FAILS TO FLAKE INLAND TI-CO®!

Switch to **TI-CO** Non-Flaking Galvanized saves manufacturers up to 15% in Production Costs.

A well-known garage door manufacturer dispensed with plating operations—reduced costs 10%. A leading furnace manufacturer saved $20 per thousand parts produced by eliminating cleaning and painting. A company making roller gravity conveyors cut out similar operations. These are just a few of many case histories of manufacturers who realized important savings and improved their product when they started using TI-CO Galvanized Sheets.

Whenever a product requires the strength of steel, plus corrosion resistance, Inland TI-CO is the most satisfactory . . . the most practical . . . the most economical material to use. That's because TI-CO is produced with a zinc coating that will not flake even under the toughest conditions. The coating stretches with the base metal during fabrication. Deep drawing, brake or roll forming, crimping, stamping, lock-seaming even severe spin-drawing . . . TI-CO takes them all in stride with no flaking or peeling. With TI-CO there's no need for costly dipping or touching up. And the uniform, bright spangled finish adds to the over-all attractiveness of the product.

If you're manufacturing or designing a metal product that requires corrosion resistance, consider TI-CO Galvanized Sheets. Manufactured in coils or cut lengths up to 60″ widths, gauges 8 to 30 inclusive. Consult your local steel distributor or Inland sales representative. Write today for a free informative booklet on TI-CO.

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NEW EQUIPMENT

movable jaw (in most sizes) allows a square nut to fit flat to the inside jaw surface. Better adaptability to different size nuts, including Metric & Whitworth, results from precision non-slip adjustment. (Proto Tool Co.)

For more data circle No. 47 on postcard, p. 135

Diesel Engines

A new turbo-supercharged opposed-piston diesel engine is small and lightweight. Supercharging is said to add 50 pct to the capacity of the rugged two-cycle diesel, making it available in ratings up to 3600 hp. An added dividend reported for the turbocharged OP is a 5 to 10 pct saving in fuel consumption. The engine adapts to use in stationary power plants, marine installations, locomotives and mobile power plants. Turbocharging is available in the 6- and 12-cylinder configurations of the 8⅛ x 10-in. opposed-piston engine. Weight of the 6-cylinder basic engine is approximately 24,900 lb, only 2000 lb more than the non-supercharged engine. Weight of the 12-cylinder unit is approximately 46,200 lb just 4000 more than the corresponding non-supercharged engine. (Fairbanks, Morse & Co.)

For more data circle No. 48 on postcard, p. 135

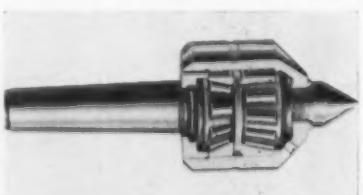
Magnetic Belting

Manufacturers and processors handling ferrous parts, formed objects, containers, canned goods, etc. can speedily convert their belt conveyors to magnetic conveyor-elevators by means of new bolt-together components. The units consist of 4-in. wide "rails" — actually continuous magnetic face-plates of powerful non-electric Alnico V castings. They come in various standard lengths, shapes and magnetic strengths, and ready for simple installation under new or existing conveyor belts. Once in position, the magnetic setup maintains a constant, penetrating magnetic field through the whole working surface of the moving belt, causing ferrous objects to adhere firmly to the belt at high speeds, up or down steep inclines, or even suspended from the belt's under surface. (Eriez Mfg. Co.)

For more data circle No. 49 on postcard, p. 135

Live Centers

Live centers in a new line feature Timken tapered roller bearings, a replaceable center point and a special bearing adjustment. The centers are mounted on the same heavy-duty precision Timken



tapered roller bearings used on machine tool spindles. This enables them to absorb plenty of thrust and heavy radial loads with little wear.

Perforations perplexing you?

If you have a design problem that's got you down maybe Hendrick can be of help. Sometimes the easiest and quickest way to enhance a product's beauty is to include a pleasing pattern of perforations in its design. Hendrick perforated metal not only helps increase a product's overall attractiveness, but also adds to its saleability as well. And whatever material you're using . . . whether it's metal, masonite, rubber, plastic, hard or insulated board for decorative display or fabricating purposes you can draw on Hendrick's long experience and perforating facilities to fill the bill. Write for details.

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Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

Heavy cuts at fast turning speeds thus are possible. A special built-in adjustment for pre-load and take-up for bearing wear prolongs the life of the center. Lubrication is needed only once a year; an O-ring seal at the rear of the bearing housing provides protection against entry of cutting oils, chips and dirt and seals in the lubricant. Centers can use Morse-Hendy, Brown & Sharpe or Jarno tapers. (Trio Machine & Mfg. Co.)

For more data circle No. 50 on postcard, p. 135

Safety Shield

Persons who observe molten metal or extremely hot objects can face radiant heat above 2000°F without harm while wearing this lightweight plastic shield. The wearer suffers no discomfort through exposure to high temperatures, yet he can see clearly to perform precision tasks before a furnace or crucible. The shatterproof visor is coated with a material which reflects 95 pct of the infrared rays. Visibility is high; temperature between the face and visor remains at approximately 80°F. (Vacuum Equipment Div., N. Y. Air Brake Co.)

For more data circle No. 51 on postcard, p. 135

Throw-away Inserts

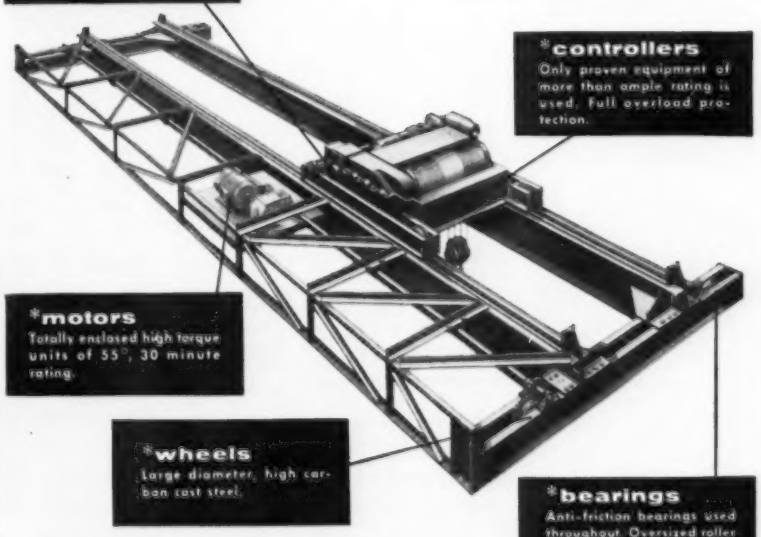
High-speed throw-away insert blanks now available are manufactured from a tungsten-cobalt high speed steel. They are designed for jobs where high speed steel will outperform other materials, due to presence of shock or excessive abrasiveness. The standard square and triangular throw-away inserts fit about all styles and sizes of insert style holders; practically any style or size of carbide insert can be duplicated. (Ed. Castor Associates).

For more data circle No. 52 on postcard, p. 135

Ductility Tester

Actual operating conditions can be accurately simulated with a new multi-purpose ductility testing machine. Load, applied via a motor driven hydraulic pump, appears on either of two large gages mounted on the unit. The low range gage has a 6000-lb capacity; the high range gage indicates to 30,000-lb loads. Both the machine and the gages have protection against accidental overloading. In addition to load, gages also indicate clamping pressure and penetration depth.

no crane of comparable quality is more *CONSERVATIVELY PRICED!*


*load brakes
Powerful disc and helix type with high safety factor.
*controllers
Only proven equipment of more than ample rating is used. Full overload protection.
*motors
Totally enclosed high torque units of 55°, 30 minute rating.
*wheels
Large diameter, high carbon cast steel.
*bearings
Anti-friction bearings used throughout. Oversized roller bearings (double row) used in main truck wheels.

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*In any crane, these are the parts that handle the heavy work... the parts that *must be* top quality if you're looking for crane *dependability.* Compare Cranemaster engineering at these critical points with any industrial shop crane. Then compare prices. Time and time again Abell-Howe proves it has the top value in overhead traveling cranes... in capacities to 20 tons—spans to 60 feet.

Send for **BULLETIN C-108**

7747 Van Buren Street ABELL-HOWE COMPANY Forest Park, Illinois

A wide variety of dies available simulate either shallow or deep drawing requirements up to 2¼-in. maximum stroke. (Tinius Olsen Testing Machine Co.)

For more data circle No. 53 on postcard, p. 135

Demineralizer

Featuring cast acrylic columns, stainless steel cabinet, and integral regenerant tanks a new unit demineralizes at flow rates up to 60 gph. It's accomplished via multi-column ion exchange principles. Raw water passes through four columns: two each, alternately, of cation and anion resins. The third and fourth columns remove more weakly ionized impurities. Thus effective removal of free CO_2 and silica is carried out; a high purity effluent results. (Penfield Mfg. Co.)

For more data circle No. 54 on postcard, p. 135

Flame Cutter

Versatile in operation, a new flame cutting machine cuts out irregularly shaped parts from steel plate. A readily prepared template of masonite or sheet metal guides its cutting torch. Principally for cutting steel plate from ¼ to 2-in. thick, average cutting rates of 24 and 10 ipm can be achieved, respectively. The tracing head is driven by a variable speed gear head motor, designed to cover a wide range of cutting speeds. Torch cutting equipment for use with either natural gas, propane, or acetylene can be supplied. (Speedi-Burn Products Co., Inc.)

For more data circle No. 55 on postcard, p. 135

Cutter, Welder

If you are looking for a relatively versatile, extremely low-cost welding and cutting outfit, then a newly introduced set may fill the bill. This double duty outfit does multiple jobs such as welding, cutting, heating, brazing, soldering, etc. With special tips, an operator can also do scarfing, rivet cutting and gouging. Welding range with three tips supplied is 1/32 to ⅜ in., but nine other tips increase welding capacity to ⅞-in. Cutting range is from ⅛ to 4 in. (with correct accessory tips.) (Smith Welding Equipment Corp.)

For more data circle No. 56 on postcard, p. 135

Mist Coolant Unit

A new spray mist-coolant unit incorporates all necessary controls in a single "machine-styled" compact unit. Elements provided include an air filter, a trap, a regulator and a gage, solenoid-valve and conduit box, pressurized coolant reservoir and filter. The solenoid valve connected to the machine circuit starts spraying mist-coolant when the machine is turned on. A pressurized coolant reservoir permits mounting in any location without siphon-lift problems, no air

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On this fully automatic pusher type heat treating furnace (product of Surface Combustion Corporation) a Spencer 1507 blower delivering 700 c.f.m. at 24 oz. pressure supplies air to burner tube eductors for controlled combustion.

Considerations in selecting a blower for this new Surface furnace were: constant pressure, dependable operation, long service life. Spencer was specified.

Whatever your need in blowers, from 1/3 to 1,000 H.P., volumes up to 20,000 C.F.M., pressures from 4 oz. to 10 lbs., it will pay to check with SPENCER.

Request catalog 126-A Containing complete specifications.

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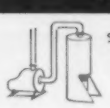
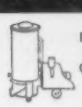

STATIONARY VACUUM SYSTEMS


PORTABLE VACUUM CLEANERS

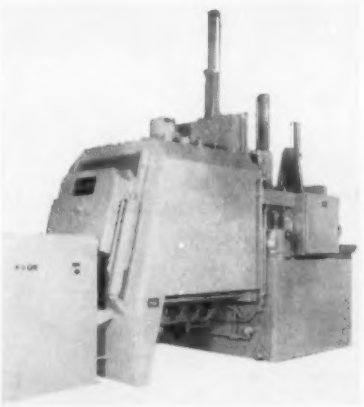
PNEUMATIC CONVEYING SYSTEMS

waste, no interrupted flow. All parts are protected against corrosion. (Bijur Lubricating Corp.)

For more data circle No. 57 on postcard, p. 135

Heat Treating Furnace

This straight through heat treating unit uses quiet gas burners of alloy construction which operate without tail flames. Featuring a 100 pct air-gas premix system, the unit employs new alloyed ceramic heating tubes. Its links withstand temperatures up to 2800°F. In addition, the heat-treating furnace has one-piece cast fan and shaft assemblies and cast Meehanite door plates with machined ways to improve sealing. Inner doors are of a heavier alloy frame type. A newly designed refractory arch affords added strength. Multiple finned cooling tubes provide considerable cooling capacity to the quench units. A heavy duty quench motor with an oversized propeller drive shaft insures proper circulation of the quenching medium. Provision



is made for continuous lubrication of drive components. (Ipsen Industries, Inc.)

For more data circle No. 58 on postcard, p. 135

Surface Grinder

Recommended by its maker for small work grinding operations on a high production job-lot basis is this rotary surface grinder. It grinds flat, convex or concave surfaces of work up to 6-in. OD. The column type machine produces finishes of 2 to 4 microinches in suitable types of material in routine production. It accommodates a wide range of relatively small work such as saw blades, slitters, gear cutters, matched angular contact bearings and similar parts. A key feature of the new machine is hydraulic control of the operating cycle. Automatic table reciprocation saves operator effort and permits high, uniform production on relatively long runs of identical parts. Hydraulic table feed rates are infinitely variable from 0 to 10 fpm to permit smooth, slow dressing speed and instant change to rapid traverse or reciprocating speed. This machine is available as a manual unit. (Heald Machine Co.)

For more data circle No. 59 on postcard, p. 135

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THE BIGGEST AND BEST EVER!
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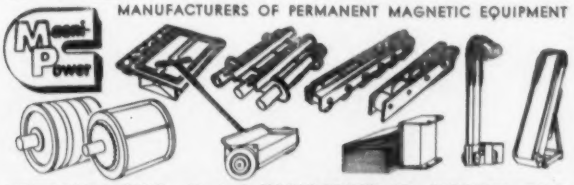
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Table adjustable for straight or taper keyways
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Since the practical application of the theory of vacuum melting, Zak Machine Works, Inc., pioneered the design and manufacture of crucibles for vacuum melting in a variety of sizes.
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The PROOF of DSC STEEL is in its PERFORMANCE ON YOUR JOB

How DSC *AccuRolled* STRIP is helping revolutionize the dining table industry

*Steelslides**

PHOTO COURTESY OF STEEL SLIDES, INC. AND PARKER RUST PROOF CO.

SUCCESS STORY—* *Steelslides* are patented and manufactured exclusively by our good customer—Steel Slides, Inc., Yonkers, New York. Introduced to the furniture market in 1954, the idea has obsoleted the venerable wooden slide and revolutionized the basic structural design of the traditional extension table.

THE PRODUCT—Sliding members, torturously roll-formed from DSC *AccuRolled* STRIP, are fabricated into compact telescoping units that attach to the underside of the table top. These units interlock and overlap to form rigid, extensible, self-supporting "backbones." Extra legs and supports are outmoded.

END TO TABLE-STYLE TUG-OF-WAR—*Steelslides* slide snugly but effortlessly. Stops dining table tug-of-war. The secret: strictest control of materials and manufacturing tolerances; surfaces protectively conditioned with Parco Compound and Endurion (supplier: Parker Rust Proof Company, Detroit 11, Michigan); plus a final treatment to provide permanent, dry lubrication.

REASON FOR SUCCESS—Through a happy combination of mechanical and economic advantages, *Steelslides* help extension table makers improve the design and construction of their goods and reduce overall manufacturing costs in the bargain—a strong merchandising inducement.

THE ROLE OF DSC AccuRolled STRIP—The successful manufacture of STEEL SLIDES depends on high speed roll-forming and steel that can make the punishing deformations of the job. The key to performance is GAUGE AND TEMPER UNIFORMITY which DSC *AccuRolled* STRIP provides . . Here's the proof . . .

A MARATHON PERFORMANCE TEST — The record (based on aggregate shipments, 1955 through 1957) shows that 99,813 pounds out of every 100,000 pounds met the customer's quality-control standards; rejections for all reasons averaged 187 pounds.

JOB-PERFORMANCE SCORE 99.813%

WHAT THIS CAN MEAN TO YOU—This performance was brought about by the customer's production skills teamed up with DSC *stripmanship*. That's how we'll work with you. For complete information call a DSC Customer Rep . . . today?

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MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.
Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

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The Iron Age Summary

Auto Slump Clouds Steel Outlook

Slight pickup in orders noted by several large mills. But autos continue to drag.

Low user inventories pointed up by recent snow storm and cold wave.

▪ Fresh evidence that the bottom of the recession in steel may have been reached: Several large mills have noted a continued slight improvement in their order volume.

This does not mean that a definite upturn is in sight. But it does indicate that some steel buyers are taking another look at their policy of inventory cutbacks.

1954 Parallel? — Some sources believe the situation today parallels that of 1954 when steel order volume during that slump hit bottom in April. The real improvement did not become apparent until Labor Day of that year.

The low state of steel inventories showed up dramatically during the recent heavy snows and cold wave. Some steel users had let their stocks sink to the danger point, and when the big storm hit they couldn't get the delivery they were counting on. In some cases, mills came to the rescue by pulling steel out of ice-locked river barges.

Automotive Slump Holds—The automotive industry is still sitting on its hands—and until the car builders show some signs of life, the steel market will drag along at a slow pace. Reports from Detroit say that steel orders from the automakers will be less this month than in January—and in some cases even below February.

One steel salesman sums up the auto situation this way: "Even if we get some big tonnage orders, we still won't have enough for a very good operating month."

Short-term Ordering—Some of the large auto companies are ordering only enough steel for two to three weeks' use. Every few weeks they come back with another small order to take care of the next period. Most steel offices close to the auto industry believe business will continue at about the same low level for some time.

In the midst of all the gloom, one product — tinplate — is going against the trend. Tinplate mills report that shipments are continuing at the high rate of January. Mill inventories are falling. March promises to be the best month so far this year. And the first quarter will be only a little under last year.

Price Boost Spurs Sales—Further, a March 10 increase in can prices means that the canmakers will be pressed to make heavy shipments before the price deadline. This should deplete their tinplate stocks.

There are reports of minor improvement in merchant wire and standard pipe. But other products, including plate and structural, are standing still for the moment.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,419	1,475	1,538	2,496
Ingot Index				
(1947-1949=100)	88.3	91.8	90.7	155.4
Operating Rates				
Chicago	57.0	58.0*	58.0	94.0
Pittsburgh	56.0	58.0*	58.5	99.0
Philadelphia	57.0	47.5	62.0	105.0
Valley	43.0	44.0*	45.0	96.0
West	76.0	74.0*	63.0	100.0
Buffalo	37.0	39.0	51.0	105.0
Cleveland	34.5	35.0*	36.0	99.0
Detroit	46.0	49.0*	53.0	100.0
S. Ohio River	28.5	52.0*	41.0	84.0
South	51.5	51.5	54.0	95.0
Upper Ohio R.	66.0	63.0*	58.0	104.0
St. Louis	79.0	92.0*	74.0	99.5
Northeast	31.0	31.0	31.0	31.0
Aggregate	...	54.6	54.7	97.5

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	$66.49	$66.49	$66.42	$62.90
Scrap, No. 1 hvy (Gross ton)	$37.67	$37.33	$36.67	$50.50
No. 2 bundles	$28.50	$28.83	$28.17	$41.83
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	25.00	25.00	25.00	32.00
Lead, St. Louis	12.80	12.80	12.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel electrolytic	74.00	74.00	74.00	74.00
Tin Straits, N. Y.	94.75	94.875	93.125	99.00
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

New Cupola Interests Foundries

Experimental unit operating at temperatures up to 1200°F is turning out nodular iron for pressure pipe.

Increased efficiency and greater heat control described as major advantages.

■ A new type of high temperature air blast for cupolas is attracting interest in foundry circles. Although the first unit is still in the experimental stage at a Coshocton, O., foundry, several additional ones have been ordered.

The new hot blast equipment departs from conventional types in that it is made of high alloy steel rather than cast iron and discharges air at higher temperature—up to 1200°F, enough to set wood on fire. It has been developed by the Brown Fin Tube Co. of Elyria, O., based on similar units designed for refineries and steel mill soaking pits. Eventually 1300°F temperatures are expected.

Product Used in Pipe—The first experimental unit has been in operation at the James V. Clow & Son foundry at Coshocton, O., turning out nodular iron for ductile cast pressure pipe. This product is in demand for its higher strength, higher ductility and greater resistance to shifting loads caused by earth movements and traffic. A Virginia foundry is also in production on the pressure pipe and other firms are experimenting with it.

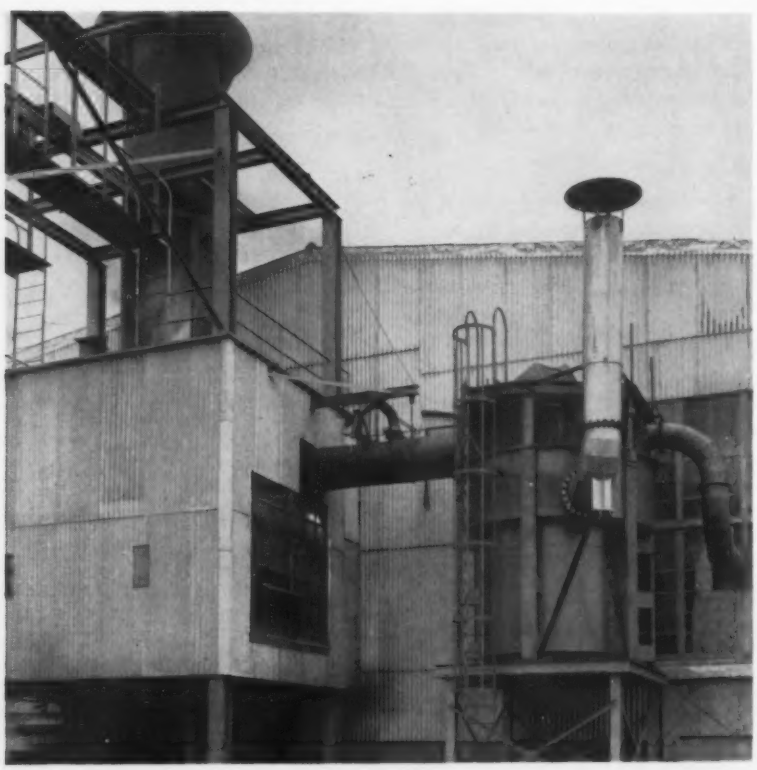
Improves Efficiency—Hot blast units generally operate at temperatures in the 500-800°F area. By super-heating air, using natural gas combustion, and feeding the air into the cupola hot rather than cold, time required to reach the 2700°F melting point in the cupola is shortened. Efficiency is also raised and control improved.

Units of similar principle are used in blast furnaces operating off exhaust gas. There, chemical by-products are also captured for sale.

Tonnage Gain Expected—At the Clow foundry the unit is turning out 10 tons per hour from a water cooled cupola with a 60 in. shell and no lining. And 15 to 16 tons per hour are confidently expected soon. Necessary melting point for the nodular iron is 2900°F or about 200°F over conventional cast iron. It uses less coke so the melting rate is faster.

Clow previously used conventional hot blast equipment which heated the air to about 400°F. Optimum temperature for the new equipment is being worked out in current experimentation and can be adjusted at will. The installation was built from scratch.

Although the temperature is high for use in this country, some European equipment is believed to have operated at up to 1600°F. Some U. S. types have also operated as high as 1200° for short durations.



SPEEDS MELTING RATE: New hot blast equipment now in use at James V. Clow & Son foundry shortens time needed to reach melting point.

Furnace Sales Slow

New orders for industrial furnaces in January were 59 pct below those of the same month in 1957, according to the Industrial Heating Equipment Assn. Orders this January amounted to $3 million.

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March Doesn't Bring Stronger Market

There's little evidence in the March order pace of a coming sales upturn.

Only tinplate producers are active as the first quarter draws near end.

▪ Steel market optimists won't be very happy with March order books. They do little to bolster belief that the steel market slump is ending.

Buying for all products, except tinplate, continues sluggish. The tinplate mills, buoyed by strong orders from the canmakers, are predicting March will be their best month so far this year.

Otherwise the sales outlook is bleak. Sheet ordering limps along with automotive tonnages being moved back from March into April. This comes on top of a transfer of February tonnages into March.

Some Buyers Active—Plate and structural sales remain slow with customers inventory-conscious. Oil country products are suffering because of the low level of drilling activity. Large diameter welded pipe has been marking time since the Memphis court decision which discouraged linepipe construction projects.

Amid all the gloom, there's one hopeful sign: Some smaller steel users are giving the sheet market a little more life. They are placing orders faster than previously. They are increasing tonnages in some cases. A few of them are specifying requirements as far as June.

Sheet and Strip—March appears to be a leveling off month with little or no gain expected by the mills over February. Automotive steel buyers continue setting back or cancelling tonnages. They have pushed back February tonnage into March and some March tonnage has been moved into April. Reduced production schedules by some auto firms are a contributing factor.

Despite the slow pace of automotive steel buying, there are a few encouraging signs in the flat-rolled market. Other customers are placing orders a little quicker than previously. Some purchasers are even thinking as far ahead as June, the mills say.

Warehouses in the midwest continue to report better sheet and strip sales. A firmer demand for light, flat-rolled products is indicated by **West Coast** mills. And in both areas galvanized sheet is described as doing well.

Plate and Structurals—No improvement in the market is expected this month, with shipments holding at about January and February levels. Mills are hoping for greater activity in April as roadbuilding tempo increases.

Structural demand is somewhat stronger than plate. Fabricators in the **Detroit** area are buying some plate and small shapes to fill orders.

Bar—Orders are holding about even with January. This is encouraging because some mills had feared a further drop. The market is characterized by flurries of activity followed by quiet.

Tinplate — Strong buying pace continues, and mill shipments are remaining at the high level registering in January. Producers report their inventories are being reduced. On current estimates, March may be the best month so far this year, and the first quarter will probably be only a little under last year's all-out rate. A stimulant to sales is the expected increase in can prices due March 10. Canmakers are making heavy shipments to their customers during the early part of the month. As a result their stocks of tinplate will be depleted probably bringing them into the market for more by month's end.

Pipe and Tubing—The outlook for oil country seamless is bleak. A cut in state production allowances of crude oil will clearly not stimulate drilling. And this comes at a time when drilling rates are already down. Seamless pipe is expected to experience a seasonal pickup shortly, but no evidence of it has yet appeared. Hand-to-mouth buying on small sizes of buttweld pipe continues.

Warehouses — Mild sales gains are reported by **Midwestern** outlets.

To stimulate buying in larger quantities one warehouse chain, Joseph T. Ryerson & Son, has raised galvanized sheet discounts at Cleveland. The new schedules, based on similar arrangements used in Ryerson's Cincinnati and Chicago territories, are as follows:

Discounts on 20,000 lbs and over were raised from 70 cents to $1.50, on 10,000 lbs they were lifted from 30 cents to $1.25; and on orders of 5000 to 10,000 lbs they were increased from 10 cents to 50 cents.

PURCHASING AGENT'S CHECKLIST

Nickel industry switches to the hard sell. **P. 73**

Construction industry was largest steel user in 1957. **P. 80**

New material has properties of both metals and ceramics. **P. 126**

COMPARISON OF PRICES

(Effective March 4, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	March 4 1958	Feb. 25 1958	Feb. 4 1958	March 5 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	50.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. ternes	9.55	9.55	9.55	9.20
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	43.25
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.275
Light rails	6.50	6.50	6.50	6.25
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.670¢

	March 4 1958	Feb. 25 1958	Feb. 4 1958	March 5 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.97	$70.97	$70.51	$66.88
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	73.87	73.87	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	65.00
Basic, del'd Philadelphia	70.47	70.47	70.01	66.38
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	65.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.49	$66.49	$66.42	$64.00
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$37.50	$36.50	$36.50	$50.50
No. 1 steel, Phila. area	38.00	38.00	38.00	55.50
No. 1 steel, Chicago	37.50	37.50	35.50	45.50
No. 1 bundles, Detroit	31.50	29.50	28.50	42.50
Low phos., Youngstown	41.00	38.50	38.50	50.50
No. 1 mach'y cast, Pittsburgh	51.50	50.50	49.50	56.50
No. 1 mach'y cast, Phila.	48.50	47.50	47.50	57.50
No. 1 mach'y cast, Chicago	*48.50*	49.50	48.50	49.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$37.67	$37.33	$36.67	$50.50
No. 2 bundles	*28.50*	28.83	28.17	41.83
Coke Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.38
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50-$19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	25.00	25.00	25.00	32.00
Copper, Lake, Conn.	25.00	25.00	25.00	32.00
Tin, Straits, N. Y.	94.75†	94.875*	93.125	99.00
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	12.80	12.80	12.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Industrial Lists Lift Market

Unexpected strength in bidding for automotive lists pulled the market together.

Low volume of scrap keeps the price levels intact in spite of low mill demand.

▪ Some aggressive bidding on industrial lists pulled the market together just as another collapse appeared likely.

The short supply of available scrap in quality steelmaking grades brought out spirited bidding for choice automotive lists. The result was a price average up to $4 above a month ago.

In the markets more closely affected by the industrial lists, prices immediately went up. In some cases it was on appraisal. But mill buys in other instances substantiated higher prices.

Of the major markets, only Chicago was shaky. While No. 1 heavy melting clung to its quoted price, most secondary grades and the railroad list slipped slightly.

As a result of the Chicago situation, the No. 2 bundle Composite Prices dipped slightly, in contrast to the slight rise in The IRON AGE No. 1 heavy melting Composite, which rose to $36.67.

Pittsburgh — Prices of the best grades of scrap are up on the basis of strong industrial bidding and scattered mill purchases. Local industrial bundles went for $4 over last month. A mill on the fringe of the district is offering the equivalent of $37 in Pittsburgh for No. 1 heavy melting. Cast grades, turnings, and low phos are up. Secondary open-hearth grades are also holding firm. The current strength brings reports that at least one local blast furnace may be put back on.

Chicago—Prices slipped on small purchases by local mills, but offers to purchase at $2 below current levels brought no takers. Factory bundles, expected to slip, brought unexpectedly strong prices on new lists. Broker buying prices are being pushed down, but have made little headway against strong dealer resistance, particularly since supplies are low and some scrap is being shipped out of the district.

Philadelphia—An extended lull in this market was broken only by a few sales of cupola cast to upriver foundries at $40, an increase of $2. Export continues to hold prices together, but even cargo loadings aren't shaping up as well as hoped.

New York—Prices continue unchanged in a very slow market. Little if any material is moving on domestic orders, at least for steelmaking and blast furnace grades. But exports continue to prop up the price structure. A feeling of optimism that the worst is over is widespread.

Detroit — Scrap dealers may be short on customers, but they're also short on sources of scrap. As auto output dropped, so has availability of quality scrap in this area. Slim offerings on March industrial lists caused prices on many grades to rise $1 to $3. On appraisal, new dealer prices reflect the tighter supply.

Cleveland—Two sales in the Valley and an increase in prices for production lists indicate some market pressure. One purchase was made from restricted yards by two Valley mills at $39. Another bought low phos at $42. Production lists in the Cleveland area were sold for $38 to $40 on track, an increase from last month. The foundry market also showed some strength.

Birmingham — The market continues dull, but there are small amounts moving at present levels. Some dealers who have been nursing inventories have started selling nominal amounts since the break in the weather. They had reached the point where inventories were becoming too expensive to hold.

St. Louis — Steel mills have not changed buying prices, although some adjacent markets have cut prices. Movement of scrap is still light. A leading railroad withdrew its list of about 1000 tons of heavy melting steel because of low prices.

Cincinnati — The sight of three barge loads of scrap going up river stampeded local mills into raising their offering prices, breaking a long stalemate. Cincinnati area delivered prices went to $35 for No. 1 heavy melting and $31.50 for No. 2 heavy melting. The increase is a delayed reaction rather than a sudden market upsurge.

Buffalo — Inactivity continues here and prices are unchanged. Inventories and receipts are still low. Small quantities of selected grades of industrial scrap are being shipped to the Valley. Because of increased use of the grade, "structurals and plate, 2 ft and under," has been added to the list.

Boston — A sudden buying by pipe mills has boosted the cast market up a couple of dollars in what has been a quiet market for several weeks.

West Coast—There is no life to the market up and down the Coast. Very little scrap is moving.

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SCRAP PRICES *(Effective March 4, 1958)*

Pittsburgh

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	30.00 to 31.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and ms. turn.	18.00 to 19.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Low phos. punch'gs plate	41.00 to 42.00
Heavy turnings	35.00 to 36.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	50.00 to 51.00
Rails 2 ft and under	55.00 to 56.00
RR steel wheels	48.00 to 49.00
RR spring steel	48.00 to 49.00
RR couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	40.00 to 41.00

Chicago

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	40.00 to 41.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Low phos. forge crops	50.00 to 51.00
Low phos. punch'gs plate	45.00 to 46.00
Low phos. 3 ft and under	43.00 to 44.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	49.00 to 50.00
Rerolling rails	55.00 to 56.00
Rails 2 ft and under	56.00 to 57.00
Locomotive tires cut	49.00 to 50.00
Cut bolsters & side frames	46.00 to 47.00
Angles and splice bars	50.00 to 51.00
RR steel car axles	55.00 to 56.00
RR couplers and knuckles	46.00 to 47.00
No. 1 machinery cast.	48.00 to 49.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	39.00 to 40.00
Cast iron brake shoe	39.00 to 40.00
Cast iron wheels	36.00 to 37.00
Malleable	52.00 to 53.00
Stove plate	39.00 to 40.00
Steel car wheels	49.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	$37.50 to $38.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.50 to 38.50
No. 2 bundles	27.00 to 28.00
No. 1 busheling	37.50 to 38.50
Machine shop turn.	20.00 to 21.00
Mixed bor. short turn.	21.00 to 22.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Clean cast. chem. borings	32.00 to 33.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft and under	43.00 to 44.00
Low phos. punch'gs	43.00 to 44.00
Elec. furnace bundles	39.00 to 40.00
Heavy turnings	33.00 to 34.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	58.00 to 60.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	40.00 to 41.00
Malleable	57.00 to 58.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast.	48.00 to 50.00

Cleveland

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	34.00 to 35.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	26.00 to 27.00
No. 1 bushelings	34.00 to 35.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Cut struct'r'l & plates, 2 ft & under	42.00 to 43.00
Drop forge flashings	34.00 to 35.00
Low phos. punch'gs, plate	36.00 to 37.00
Foundry steel, 2 ft & under	37.00 to 38.00
No. 1 RR heavy melting	42.00 to 43.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Railroad grate bars	17.00 to 18.00
Steel axle turnings	20.00 to 21.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	47.00 to 48.00
Stove plate	45.00 to 46.00
Malleable	61.00 to 62.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. plate	40.50 to 41.50

Buffalo

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Low phos. plate	34.00 to 35.00
Structurals and plate, 2 ft and under	40.00 to 41.00
Scrap rails, random lgth.	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
RR steel wheels	37.00 to 38.00
RR spring steel	33.00 to 34.00
RR couplers and knucklers	33.00 to 34.00
No. 1 machinery cast.	45.00 to 46.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	30.00 to 31.00
Drop forge flashings	28.00 to 29.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	13.00 to 14.00
Low phos. punch'gs plate	30.00 to 31.00
No. 1 cupola cast.	27.00 to 28.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	31.00 to 32.00
Automotive cast.	39.00 to 40.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
No. 1 RR hvy. melting	38.00 to 39.00
Rails, random lengths	47.00 to 48.00
Rails, 18 in. and under	54.00 to 55.00
Angles and splice bars	47.00 to 48.00
Std. steel car axles	51.00 to 52.00
RR specialties	44.00 to 45.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	39.00 to 40.00
Cast iron car wheels	37.00 to 38.00
Rerolling rails	56.00 to 57.00
Unstripped motor blocks	35.00 to 36.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	26.00 to 27.00
Elec. furnace, 3 ft & under	31.00 to 32.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and short turn.	9.00 to 10.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	34.00 to 35.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	29.00 to 30.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	26.00 to 27.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 2 dealer bundles	24.00 to 25.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	25.00 to 26.00
No. 1 machinery cast.	34.00 to 35.00
Mixed yard cast.	32.00 to 33.00
Charging box cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 31.00
Unstripped motor blocks	27.00 to 28.00

Birmingham

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	36.00 to 37.00
Elec. furnace, 3 ft & under	34.00 to 35.00
Bar crops and plate	40.00 to 41.00
Structural and plate, 2 ft	39.00 to 40.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	44.00 to 45.00
Rails, 18 in. and under	49.00 to 50.00
Angles & splice bars	42.00 to 43.00
Rerolling rails	51.00 to 52.00
No. 1 cupola cast.	50.00 to 51.00
Stove plate	49.00 to 50.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	40.00 to 41.00

Cincinnati

Brokers buying prices per gross ton, on cars.

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	15.00 to 16.00
Low phos, 18 in. and under	40.00 to 41.00
Rails, random length	44.00 to 45.00
Rails, 18 in. and under	54.00 to 55.00
No. 1 cupola cast.	41.00 to 42.00
Hvy. breakable cast.	33.00 to 34.00
Drop broken cast.	47.00 to 48.00

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast.	40.00

Los Angeles

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	32.00
No. 1 dealer bundles	30.00
No. 2 bundles	22.00
Machine shop turn.	$9.00 to 11.00
Shoveling turnings	11.00 to 13.00
Cast iron borings	11.00 to 13.00
Elec. furn. 1 ft and under (foundry)	45.00
No. 1 RR hvy. melting	36.00
No. 1 cupola cast.	38.00 to 40.00

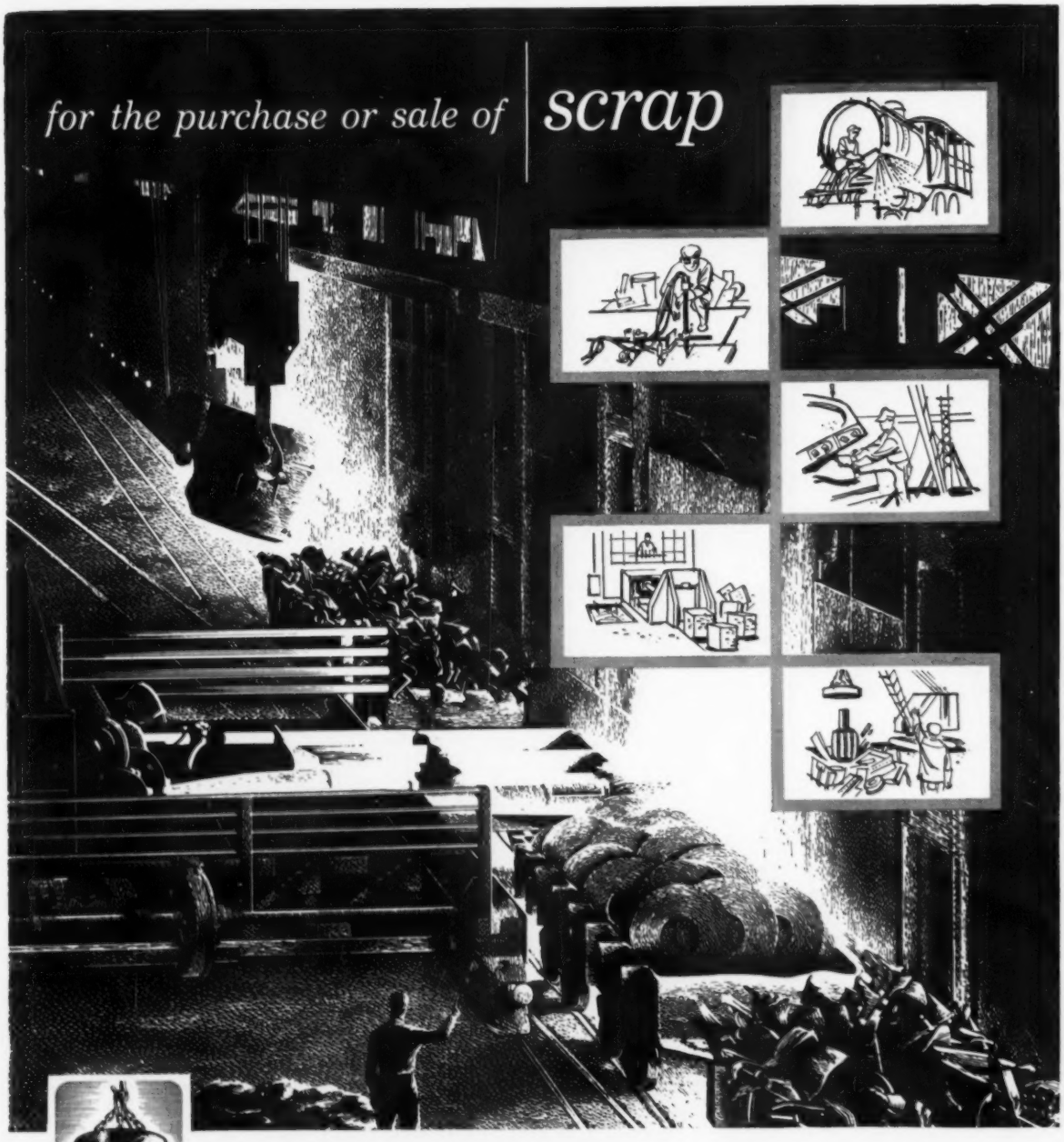
Seattle

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 2 bundles	24.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	28.00
No. 1 dealer bundles	32.00
No. 2 bundles	25.00
Mixed steel scrap	27.00
Busheling	22.00
Bush., new fact, prep'd	32.00
Bush., new fact, unprep'd	26.00
Machine shop turn.	17.00
Short steel turn.	21.00
Mixed bor. and turn.	17.00
Rails, rerolling	41.00
Cast scrap	$44.00 to 47.00

for the purchase or sale of **scrap**



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Copper Hopes For Spring Upturn

Producers are bucking the pressure to cut prices.

They say copper is tied closely to overall conditions. They hope for a business upturn this spring.

A lower price would mean a 2¢ tariff.

▪ Time has become a key factor in the copper price picture.

Producers are selling at 25¢ per lb. But they admit the market is very weak, and there is pressure for a price cut. All other copper suppliers are quoting at least several cents below producers, and custom smelters are doing spotty business at 23¢.

On the Spot—But a drop from the current producers' price would be no ordinary market situation. When the producers' price averages 24¢ or less in a month, a 2¢ tariff is automatically imposed. This would put at least one of the Big Three producers on the spot.

Anaconda gets two-thirds of its output from holdings in Chile. Much of this goes to Europe, but enough comes to the U. S. to make the company take a close look before matching a lower price posted by another major producer.

Tariff Would Hurt—Any tariff would have to be paid by the seller or the lower market price would not in effect be a reduction. In Anaconda's case it might be enough to take the cream off new orders the lower price might prompt.

Kennecott gets about one-third of its output from Chilean subsidiaries, but the company says all of this goes to Europe. Phelps Dodge, third member of the Big Three producers, is completely domestic.

The producers say their metal is tied closely to general economic conditions. But things aren't going to pick up much until there are signs that business has bottomed out and an upturn is imminent.

Economic Weather — Most observers say the producers can hold out another month or so. If business, particularly automotive, electrical, and building, starts up by then, the whole problem will become strictly academic.

Otherwise they predict some confusion—a price cut probably 1¢ to 2¢ initiated by Phelps Dodge, some discounting, and concessions not done to any extent thus far, and the distinct possibility that Anaconda might not go along with the lower price immediately.

Aluminum

Latest figures from the Aluminum Assn. indicate the industry is having some success in working the market toward a balance. Primary production in January was off from the previous month, while shipments of sheet, plate and foil were up.

But, it is generally conceded that there is still a long way to go to boost demand in line with supply.

Industry may well have a difficult road ahead. There is increasing feeling among top aluminum men that, despite the current softness of the market, output in 1958 may hit a new record.

Revised figures put output in 1957 at 1,647,710 tons, down slightly from the record 1,678,954 tons produced in 1956. Feeling is that output this year may well top 1.7 million tons.

	Jan. 1958	Dec. 1957
Primary Production	139,909	140,033
Shipments		
Non-heat-treatable	36,118	31,350
Heat-treatable	8007	6631
Total Sheet, Plate	44,125	37,981
Foil	8629	7719
(short tons)		

Tin prices for the week: Feb. 26—94.625; Feb. 27—94.625; Feb. 28 — 94.625; March 3 — 94.75; March 4—94.75.*

*Estimate.

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in February based on quotations appearing in THE IRON AGE, were as follows:

Electrolytic copper, del'd Conn. Valley	25.00
Copper, Lake	25.00
Straits Tin, New York	93.901
Zinc, E. St. Louis	10.00
Lead, St. Louis	12.80
Aluminum ingot	28.10

Note: Quotations are going prices

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	26.00	25.00	8/1/57
Aluminum ingot	28.10	27.10	8/1/57
Copper (E)	26.00	27.00	1/13/58
Copper (CS)	23.00	23.00	2.26.58
Copper (L)	25.00	27.00	1/13/58
Lead, St. L.	12.80	13.30	12/2/57
Lead, N. Y.	13.00	13.50	12/2/57
Magnesium ingot	36.00	34.00	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	200-250	165-250	1/29/58
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see above; other primary prices, pg. 180.

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MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3.
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size"	¼	⅝-⅞	¾-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

Factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade.. (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	48.13	.....	45.36	48.32
Brass, 70/30	42.09	43.23	42.63	45.60
Brass, Low	44.90	45.44	44.84	47.71
Brass, R L	45.67	46.21	45.61	48.48
Brass, Naval	47.07	.....	41.38	50.48
Munts Metal	45.19	.....	41.00	.....
Comm. Bs.	46.98	47.52	46.92	49.54
Mang. Bs.	50.81	.....	44.91	.....
Phos. Bs. 5%	67.17	.....	67.67	.....

Free Cutting Brass Rod 31.03

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy, $10.00. Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.55
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) ..$2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 50.00
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9%, dollars per troy oz..$ 2.25
Iridium, dollars per troy oz. ..$80 to $90
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York .....$227 to $230
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz...$19 to $21
Platinum, dollars per troy oz...$72 to $75
Rhodium .....$120.00 to $125.00
Silver ingots (¢ per troy oz.)..... 88.625
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 24.75
No. 120 ..... 23.75
No. 123 ..... 23.00
80-10-10 ingot
No. 305 ..... 28.75
No. 315 ..... 26.75
88-10-2 ingot
No. 210 ..... 35.75
No. 215 ..... 31.50
No. 245 ..... 28.25
Yellow ingot
No. 405 ..... 20.75
Manganese bronze
No. 421 ..... 22.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.75-25.75
0.60 copper max. 24.50-25.50
Piston alloys (No. 122 type)..23.75-24.50
No. 12 alum. (No. 2 grade) ...21.00-21.75
108 alloy 21.25-22.25
195 alloy 24.00-25.50
13 alloy (0.60 copper max.) ..24.50-25.50
AXS-679 .....21.25-22.25

(Effective March 3, 1958)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 22.00-23.00
Grade 2—92-95% 21.00-21.75
Grade 3—90-92% 20.00-20.75
Grade 4—85-90% 17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	21	20¼
Yellow brass	16⅛	14½
Red brass	18⅝	17⅛
Comm. bronze	19¼	18½
Mang. bronze	14⅞	14⅛
Yellow brass rod ends	15⅝	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 18¾
No. 2 copper wire 17¼
Light copper 15
*Refinery brass 16⅜
Copper bearing material 16¼
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 18¾
No. 2 copper wire 17¼
Light copper 15
No. 1 composition 17
No. 1 comp. turnings 16½
Hvy. yellow brass solids 12
Brass pipe 13⅜
Radiators 13

Aluminum

Mixed old cast. ..... 12½—13½
Mixed new clips ..... 14½—15½
Mixed turnings, dry ..... 13 —14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 16½—17
No. 2 copper wire ..... 14½—15
Light copper ..... 12½—13
Auto radiators (unsweated).. 10½—11
No. 1 composition ..... 14 —14½
No. 1 composition turnings.. 13 —13½
Cocks and faucets ..... 11½—12
Clean heavy yellow brass ... 9½—10
Brass pipe ..... 11½—12
New soft brass clippings .... 12½—13
No. 1 brass rod turnings .... 10 —10½

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10 —10½
1100 (2S) aluminum clippings 13 —13½
Old sheet and utensils ..... 10 —10½
Borings and turnings ..... 6½— 7
Industrial castings ..... 10 —10½
2024 (24S) clippings ..... 11½—12

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1⅝

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed. 18
Nickel silver turnings, mixed. 15

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 3½— 3⅝
Batteries, acid free ..... 2½— 2¾

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 14½—15
Siphon tops 42
Small foundry type ..... 12 —12⅛
Monotype ..... 12 —12⅛
Lino. and stereotype ..... 11 —11¼
Electrotype ..... 10 —10¼
Hand picked type shells .... 7 — 7½
Lino. and stereo. dross ..... 3 — 3¼
Electro dross ..... 2½— 2¾

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R5*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Owensboro, Ky.	$77.50 *G5*	$96.00 *G5*	$114.00 *G5*										
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.675 *K1*	9.00 *K1*				
	Geneva Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.825 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R4,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective March 3, 1958)

STEEL PRICES

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		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.			Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*			6.15 *W6*			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*				$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*		6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.										6.45 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*									
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*										
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*				6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.										6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*			6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*						
	Newport, Ky	4.925 *A1*	6.05 *A1*											
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*			6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*								$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*							6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*								
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*					$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*		6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*								6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*				$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*			6.15 *Y1*			
WEST	Fontana Cal.	5.675 *K1*	7.30 *K1*				8.025 *K1*	10.275 *K1*				$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*												
	Kansas City, Mo.										6.40 *S2*			
	Los Angeles, Torrance, Cal.										6.95 *B2*			
	Minnequa, Colo.										6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*							6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*	6.625 *T2*						6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.										6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

* COKES: 1.50-lb. add 25¢.
ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.

(Effective March 3, 1958)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.10 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland, Newport, Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13 C18*		8.775 *A5, C13, C18*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.55 *P3* 7.50 *P8,B5*	6.475 *R5* 6.575 *G3*	8.775 *R5* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.20 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Owensboro, Ky.	5.425 *G5*			6.475 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.85 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.20 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

(Effective March 3, 1958)

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	⅛ In.		¼ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective March 3, 1958)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	3	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4, C4*) 10 pct	Plate (*A3, J2, L4, C4*) 15 pct	Plate (*A3, J2, L4, C4*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975	.....	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	.....	14.75
So. Chicago *R3*	.....	.....	.....	9.75	.....	.....	.....
Ensley *T2*	5.525	6.50	.....	.....	.....	.....	.....
Fairfield *T2*	.....	6.50	.....	9.75	.....	6.60	.....
Gary *U1*	5.525	.....	.....	.....	.....	6.60	.....
Huntington *C16*	.....	6.50	.....	.....	.....	.....	.....
Ind. Harbor *I1*	5.525	.....	6.975	9.75	.....	6.60	.....
Ind. Harbor *Y1*	.....	.....	.....	9.75	.....	.....	.....
Johnstown *B3*	.....	6.50	.....	.....	.....	.....	.....
Joliet *U1*	.....	.....	6.975	.....	.....	.....	.....
Kansas City *S2*	.....	.....	.....	9.75	.....	.....	14.75
Lackawanna *B3*	5.525	6.50	6.975	.....	.....	6.60	.....
Lebanon *B3*	.....	.....	6.975	.....	14.50	.....	14.75
Minnequa *C6*	5.525	7.00	6.975	9.75	.....	6.60	14.75
Pittsburgh *P5*	.....	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	9.75	.....	.....	.....
Seattle *B2*	.....	.....	.....	10.25	.....	6.75	15.75
Steelton *B3*	5.525	.....	6.975	.....	.....	6.60	.....
Struthers *Y1*	.....	.....	.....	9.75	.....	.....	.....
Torrance *C7*	.....	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.50	.....	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	9.75	.....	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	26.00	40	100,110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅜ to ⅛-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective March 3, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	.....	212	193	8.65	9.20
Aliquippa *J3***	173	190	.....	.....	196	8.65	9.325
Atlanta *A8***	175	192	.....	214	198	8.75	9.425
Bartonsville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*	.....	.....	.....	.....	.....	8.65	8.95*
Chicago *N4****	173	190	172	212	196	8.65	9.325
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	8.65	.....
Crawf'dsv. *M4***	175	192	.....	214	198	8.75	9.425
Donora, Pa. *A5*	173	187	.....	212	193	8.65	9.20
Duluth *A5*	173	187	.....	212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187	.....	212	193	8.65	9.20
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	.....	217	198	8.90	9.45
Jacksonville *M4*	184-1	197	.....	219	203	9.00	9.675
Johnstown *B3***	173	190	172	.....	196**	8.65	9.325**
Joliet, Ill. *A5*	173	187	.....	212	193	8.65	9.20
Kokomo *C9**	175	189	.....	214	195*	8.75	9.30*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.60	10.275
Kansas City *S2**	178	192	.....	217	198*	8.90	9.45*
Minnequa *C6*†	178	192	177	217	198†	8.90	9.45†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.20
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	8.95	9.50*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.60	10.15
Rankin, Pa. *A5*	173	187	.....	.....	193	8.65	9.20
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*†	.....	.....	.....	236	.....	9.60	10.15†
SparrowsPt. *B3***	175	.....	.....	214	198	8.75	9.425
Sterling, Ill. *N4****	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.30
Worcester *A5*	179	.....	.....	.....	.....	8.95	9.50
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.40	12.60	15.60	18.55
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Sins OD-In.	Sins B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	.....
	2½	12	48.94	57.31	.....
	3	12	56.51	66.18	.....
	3½	11	65.97	77.25	.....
	4	10	87.61	102.59	.....

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
	Pct. Discounts			
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅜ in. and smaller	63

Rivets

	Base per 100 lb
½ in. and larger	$12.25
	Pct. Off List
7/16 in. and smaller	19

Cap Screws

	Discount (Packages) *Full Finished H. C. Heat Treat*
New std. hex head, packaged	
⅝" diam. and smaller x 6" and shorter	40 / 26
¾", ⅞", and 1" diam. x 6" and shorter	22 / 3
⅝" diam. and smaller x longer than 6"	8 / +13
¾", ⅞", and 1" diam. x longer than 6"	+ 6 / +32
	C-1018 Steel Full-Finished Cartons Bulk
¼" through ⅝" dia. x 6" and shorter	58 / 49
¾" through 1" dia. x 6" and shorter	45 / 33

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	60	60
Bulk — *Quantity*		
To ¼" diam. incl. — 25,000-and over	60	..
5/16 to ½" diam. incl. — 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk		
⅝" diam. & smaller — 25,000 and over	14	16

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955. value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	42.00
Electrodeposited	33.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	16.50
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes $1.13 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	71.70
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.05
(Philadelphia price 24.50)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.75 (nominal)
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68				
Baltimore	$.10	8.38	8.98	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57				
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.25	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65				17.60
Detroit	.15	8.58	9.85	10.60	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		7.45	8.75		7.60	8.05	7.60	7.55	11.10	16.20		19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	8.60**	10.85	11.75	8.65	8.65	8.70	8.65	13.35*	17.05	16.10	21.05	20.35
Memphis	.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee	.15	8.48	9.73	10.38	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.20			8.50	8.65	9.20	8.90	10.70				
Philadelphia	.10	8.10	9.00	9.87	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.60	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		8.50	11.20	11.55	9.05	8.30†	8.65	8.65	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.61	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81		15.26		19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** All sizes except 18 and 16 gage.
†† 10¢ zinc. ‡ Deduct for country delivery. † 3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective March 3, 1958)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R1*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	66.50	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	66.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31–0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.); $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	45.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.00	80.75	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2,* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *J3;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1;* New Bedford, Mass. (.25¢ per lb higher), *R6;* Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1,* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5,* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owenboro, Ky., *G5.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*
Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown; *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R5;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owenboro, Ky., *G5.*

(Effective March 3, 1958)

Bucket handles turnings —and other scrap, too!

Here is the husky Class K Hayward you see in so many mills and plants everywhere. You can't beat this powerful bucket for handling turnings, other scrap or almost anything else. Available also with special digging teeth for heavy rock work, cutting clay, handling rubbish. The Hayward Company, 50 Church St., New York 7, N. Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

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GET AHEAD

Stay Ahead in Your SPRAY DECORATING with Conforming Matrix

ELECTRO-FORMED NICKEL OR COPPER MASKS of all types for shielding and spraying highly intricate areas in single or multiple colors.

- Permit more shots between washings.
- Allow for reasonable dimensional differences in piece parts.
- Finger clearance affords easier loading of parts.
- Right hand tab masks free both hands for productive movements.

Send prints or sample parts, giving production requirements and results you wish to achieve.

C/M

Conforming Matrix CORPORATION

350 Toledo Factories Building • Toledo 2, Ohio

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
0.10% C, 52-57% Cr, 2.00% max Si. 37.50
7-8½% max C, 50-55% Cr, 3-6% max Si 25.00
7-8½% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C $1.31
0.50% max. C 1.31
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads $1.29
Ton lots 1.31
Less ton lots 1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads 25.65
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads 24.25
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 17.20
Ton lots 18.70
Less ton lots 19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed 18.50
Ton lots to carload packed 19.65
Less ton lots 20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 14.80
Ton lots packed 17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads 34.00
Ton lots 36.00
250 to 1999 lb 38.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk 12.80
Ton lots, packed 14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet 15.10
Ton lots, packed, pallets 16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk 7.70
Ton lots, packed 10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.20	75% Si....	16.40
65% Si....	15.25	85% Si....	18.10
	90% Si....	19.50	

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth 3.20
Crucible 3.30
High speed steel (Primos) 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.65

(Effective March 3, 1958)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ..... 10.65¢
Ton lots ..... 11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots $4.90
Less ton lots 4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 ..... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed ..... 27.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound ..... 45¢
Less ton lots, per pound ..... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.

Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.. $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

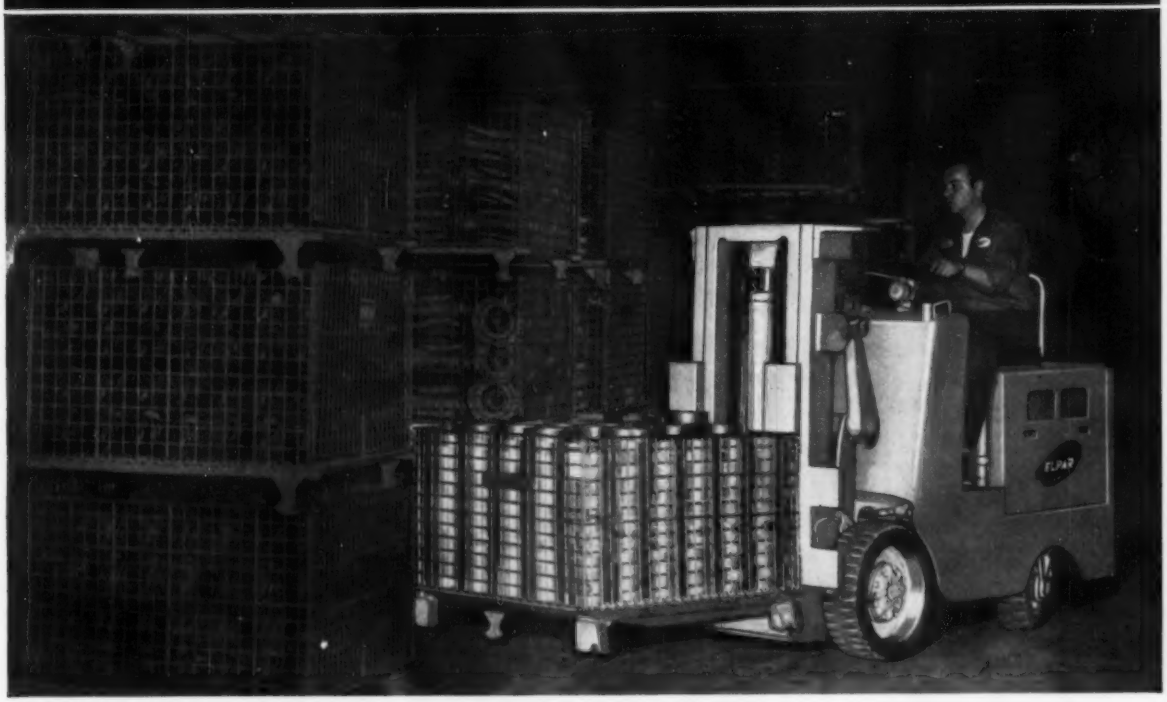
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

ELPAR ELECTRIC TRUCKS...



Save $1,200 Per Truck Per Year

Cost surveys made at a number of plants reveal that ELPAR electric trucks cost one-third less to operate and maintain than comparable gas models. Based on 2,000 hours of operation, this means an average saving of more than $1,200 per truck per year.

In addition, ELPAR electrics give twice as many years of dependable service as gas trucks operating under similar conditions. Thus, when *all* initial and replacement costs are added up, ELPAR electric trucks actually cost *less* to buy.

And, the surveys show that average downtime for ELPAR electrics is 2 to 3% while that for gas trucks is 10 to 15%.

More and more companies are converting their fleets to dependable, fume-free ELPAR trucks. Join the trend. Choose from our complete line of fork and ram trucks, low lift and high lift platform trucks, and mobile cranes—and save on *first* cost and *operating* cost. Get all the facts. . .

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of the ELPAR *Lift*, "Gas vs. Electric Trucks" and "LP-Gas vs. Electric Trucks."

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ELECTRIC TRUCKS

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Twice the Life . . . 1/3rd the Operating Costs

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
A.C. MOTORS
3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
2	1750	G.E.	M-579BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	1100	F.M.	OVZK, B.B.	4800	1800
1	800	G.E.	MT	2300	293
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW	440	514
1	350	Cr.Wh.	Size 71	208/416	1765
1	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	257
1	250	Cr.Wh.	Size 290	2300	350
1	250	Al.Ch.		550	600
1	200	G.E.	IE13 B-M	220/440	1760
1	200	Cr.Wh.	20QB	440	505
1	200	G.E.	IM	440	435
3	200	G.E.	I-17AM	2200	435
1	200	G.E.	IM	2200	580
1	150	(unused) Whse.	CW	2300	435
1	125	A.C.		440	865
1	125	Al.Ch.		440	720
1	100	G.E.	IM-10	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-573	2200	1180
1	650	G.E.	FT-559BY	440	3570
3	500	Whse.	CS-1216	2000	500
2	450	Whse.	CS-1420	2300/4150	354
1	400	G.E.	IK	2200	500
1	300	Elliott	SC-BB DP	440	1770
1	300	G.E.	KT 559A	2300	1775
1	200	G.E.	7K 17	440	580
2	200	G.E.	KT-567	440	1800
1	150/75	G.E.	IK	440	900/450
1	150	Whse.	CS8568	440	880
1	150	Whse.	CB	440	580

SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4850	C.W.	2501SL	4000/6900/13800	514
1	3500	G.E.	TS	4600/2300	360
1	2850	Whse.	Rp.f	2300/4600	514
1	2800	Whse.	Rp.f	2300	720
1	2000	Whse.		2300	102
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI	2200/12000	600
1	450	Whse.		2200	128.5
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800
1	100	G.E.	TS-7536	220/440	900

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Used - As Is - Reconditioned
RAILWAY CARS
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"ANYTHING containing IRON or STEEL"

West Coast Market Picks Up Speed

Used machine dealers there say inquiries and sales are up for smaller-sized units.

Activity in oil tool, missile, and electronics industries improves outlook.

▪ Used machinery dealers in Los Angeles and San Francisco see definite improvement setting in. It's nothing big. But inquiries are up and so are sales on smaller-sized items.

Southern California dealers feel the brightening outlook stems from activity in the oil tool industry, missile and electronics fields. Moving well are small punch presses, small lathes, and boring mills.

Buyers Update Equipment — Sales have resulted because the government is kicking loose some of its pre-1944 equipment. It's now on the Los Angeles market and small firms are updating their very old equipment.

Although business for northern California dealers is quite spotty, they also agree things are picking up.

One firm, which termed the overall picture "pretty good," says volume for the first quarter of 1958 should be up about 25 pct over the same period last year. The company is getting business from some big plants new to the area.

San Francisco Bay Area dealers look for an upsurge by May or June. They base this hope on the increased number of inquiries coming in recently. If the normal pattern of three or four months between inquiry and order is followed, business should start to improve sharply by midyear.

Prices Still Top East—Prices are off anywhere from 15 pct to 30 pct—depending on the dealer you question. One spokesman, who talks of a 30 pct price drop in the East compared with a 10 pct softening in the West, says this differential is stimulating purchases of used machinery from the East. The difference often more than offsets the freight cost. Big presses and small lathes, he noted, are the chief items being hauled cross country.

There are no acute shortages of anything in the used machine line. Other good sellers, in addition to big presses and small lathes, are: Heavy milling machines, No. 3 and above; high speed equipment used by the electronic industry such as precision millers and second operation machines; and gear equipment.

Slow in the North — Price has become more important than ever on used equipment. In fact, one dealer thinks many orders for good used machines are normally the kind that would be placed for new equipment. Operators are more price conscious than they have been for a long time. With prices on good used items down substantially, it now pays to consider used instead of new tools, a dealer says.

Used machinery in Seattle is moving extremely slow. The market maintains a wait-and-see attitude.

Distributors report customers are simply holding on to machinery they'd normally be replacing. The outlook is hopeful, however, with spring just around the corner and the Boeing Airplane Co. eyeing the missile future hopefully. As Boeing goes, so goes the machinery market in Seattle.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
8' x ¼" Bertsch Initial Type
10' x 10" Ga. Bertsch Initial Type
10' x ½" King Pyramid Type
18' x 1" Niles Pyramid Type

BORING MILL—HORIZONTAL
Cincinnati Gilbert Model J—4½" Dia. Spindle, 86" Travel, 38" x 34" Table—NEW 1956

BRAKE—PRESS TYPE
10' x ¼" & 12' x ¼" Hydraulic—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span	220/3/60
5 ton P&H	50' Span	115 Volt D.C.
5 ton Cleveland	60' Span	110 Volt D.C.
5 ton Shepard Niles	70' Span	230 Volt D.C.
8 ton P&H	55' Span	220/3/60
10 ton Shepard Niles	38' Span	440/3/60
10 ton Shaw	48' Span	230 Volt D.C.
10 ton Shaw	170' Span	230 Volt D.C.
15 ton Shepard Niles	58' Span	230 Volt D.C.
20 ton Shaw	38' Span	230 Volt D.C.
50 ton Northern	52' Span	440/3/25 A.C.
120 ton P&H	66' Span	220/3/60 A.C.
120 ton Shepard Niles	77' Span	220/3/60

CRANE GIRDERS
10 ton Capacity 77' 3" Span—No Motors

DRAW BENCHES
8,000# Waterbury Farrel Single Draw 20 Ft. Length of Draw
10,000# Aetna Standard Single Draw 44 Ft. Length of Draw

FORGING MACHINES
1" to 5" Acme, Ajax, National

FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell Complete with Transformers

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING 800 lb. to 12,000 lb. incl.

HEADERS
#250C Manville Solid Die Single Stroke
#44 Waterbury Farrel DSOD Capy. ⅝" x 6"

LEVELERS—ROLLER
37" Torrington, 19 Rolls 131/32", dia.
28" Voss Chain Leveler, Capacity .025 to .075

PRESSES—HYDRAULIC
500 ton Watson Stillman 4 Col. Piercing Press
600 ton HPM Fastraverse, Bed 36" x 36"
600 ton Elmes, 26" Stroke, 48 x 45" Bet. Cols.
1500 ton Bliss 15" Stroke, Bed 48" x 48"
1500 ton Mesta Steam Hydr. Forging Press
4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESS—KNUCKLE JOINT
600 ton Bliss No. 25, 2½" Stroke, Bed 24 x 29"

PRESSES—STRAIGHT SIDE
180 ton Hamilton #847, 12" Str. 35½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 36", Bed 44"x38"
250 ton Bliss SI 7½ Str. Blstr. 33" x 39"

PUNCH & SHEAR COMBINATIONS
Cleveland Style C, Arch. Jaw, Capy. ⅝" x ⅝"
Cleveland Style EF, Arch. Jaw, Capy. 1¼" x 1"
Cleveland Style G Single End. 60" Throat
Cleveland Style W, 60" Throat. Architectural Jaw

TORRINGTON FLAT WIRE MILL LINE
Two Stand Two High 6" x 5", Comp. with Acc.

ROLLING MILLS
8" x 10" Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High

ROLLS—FORMING
6 Stand Yoder M-1½
14 Stand Yoder, 2⅝" Shaft, 30" Bet. Housings
18 Stand Custom Built, 2½" Shaft, will take 36" wide
14 Stand Custom Built, 1⅞" Shaft x 14 3/16"

ROLLS—PLATE STRAIGHTENING
108" Bertsch, Seven Rolls 9" Dia.
72" Niles, 7 Rolls 9" Dia. Motor Driven

SHEAR—ALLIGATOR
No. 4 Mesta RH LK, Capacity 2" x 12"

SHEAR—GATE
12' x ⅜" Niagara Model 1212, NEW 1951

SHEAR LINES
36" x .020 Ga. Hallden Shear Line
42" Bliss Up-Cut Shear, Capacity .125" Max. With Hump & Run-out Tables

SHEARS—SQUARING
10' x ¼" Cincinnati #1810

SHEAR—ANGLE
6 x 6 x ⅝" Hilles & Jones

SLITTER
36" Wean Slitting Line

STRAIGHTENERS
24" Hallden Straightening & Cutting Machine
10" Die Length Hydraulic Feed, LATE

TUBE REDUCER
Standard 1¼" Tube Reducing Machine Complete with Elect. Equip.

WIRE DRAWING MACHINES
Type B Morgan 4-Block, Capy. #5 Rod down
No. 2 Vaughn 12-Die Continuous, Capy. #14 to #27

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New Stock Catalog Available

96" Model 420 Barnes deep hole drill, 2 spindle
180 ton No. 27 Williams and White bulldozer
6" capacity No. 401 Campbell "Cutamatic" abrasive cut-off
2850 CFM Worthington 650 HP synchronous motor electric drive compressor
20" swing No. 217 Baker Brothers box column heavy duty upright drill
4' arm 9" column Cincinnati Bickford super service radial
24" Cincinnati 4 spindle upright drill, spindle motor drive
No. 15½ Foote Burt vertical hydraulic feed driver for a multiple head (2)
20" x 72" Landis type D heavy duty plain hydraulic cylindrical grinder
53" No. 24A Gardner vertical spindle horizontal disc grinder, 15 HP, multiple vee belt dr.
8" x 24" No. 3S Abrasive grinder
300 lb. No. 3C Chambersburg pneumatic forging hammer
28 Nazel forging hammer
4" bar Universal "Tri-Way" horizontal boring, milling and drilling machine
30" x 30" x 8' Cincinnati Hypro two rail, one right hand side head, dial feed planer
600 ton No. 664 Toledo tierod frame knuckle joint coining press
600 ton Elmes cast steel high speed downward acting hydraulic press
500 ton Baldwin Southwark high speed hydraulic vertical downward working press
800 ton Model 2E48-800 Hamilton straight side single crank air clutch press
750 ton No. 3 National all steel Maxipress
96" x ⅜" capacity Beatty No. 29 power squaring shear, late

Ask for latest stock list

MILES MACHINERY CO.
PHONE SAGINAW PL 2-3105
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2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6½" Square Capacity Alligator Shear; clutch operated; United Engineering & Foundry
WHEELABRATOR, American; 36" x 42", skip loader hoist; dust arrester
Lindberg Endothermic Atmospheric Generator; 750 CFH, output 2200 deg. F.
Bliss Trimming Presses, Tie Rod Construction Side Shears, Capacities 113, 150, 190 tons
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
6' x 10 ga. Cincinnati Squaring Shear, ¼" x 8' Pexto Gate Shear, 20" throat
Late Upsetting & Forging Machines with air clutch, 4" National, 2½" Ajax, 4" Ajax, 5" Ajax
Williams White Bulldozers from 5-ton to 350-ton
Landis Landmaco and other Landis Threading Machines
Single & Double End Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder
No. 3 Waterbury Farrel Progressive Header. Cap. ½"; 4 stations and 1 Cutoff
Ajax Forging Presses #5-C 500-ton, #7-C 700-ton

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

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SYNCHRONOUS MOTORS
3-Phase—60 Cycle

Qu.	HP	Make	P.F.	Volts	R.P.M.
1	1750	G.E.	100	2200	3600
1	1500	G.E.	80	4150/2400	900
1	1500	Whse.	80	2300	514
2 (new)	1450	Whse.	80	4160	450
1	920	G.E.	80	2200/440	300
1	700	El. Mchy.	100	440	200
1	450	Whse.	100	2200	128
2	350	G.E.	100	2300	900
1	300	Whse.	80	2300	900
1	300	G.E.	100	2300/440	720
1	300	G.E.	800	2200/440	600
1	200	Al. Ch.	100	2200	514
1	200	Al. Ch.	100	2300/440	360

SLIP RING MOTORS
Constant Duty—3 Phase, 60 Cycle

Qu.	HP	Make	Type	Volts	R.P.M.
1	1800	Whse.	CW	2300	257
3	1500	G.E.	MT	6900/4160	444
1	600	G.E.	1M	2200	252
2	500	Al. Ch.	ARY	2300	505
1	500	G.E.	1-M	2300	450
1	400	Al. Ch.	ARY	2200	505
1	400	Whse.	CW	2200	200
1	350	G.E.	IE15B	2200	1180
1	350	G.E.	MT-412	2200	450
1	300	Whse.	CW-1012	2200	720
1	300	G.E.	1-M	440	1200
1	250	Al. Ch.	ARY	440	705
1	250	Whse.	CW	4160/2300	720
1	250	G.E.	1-M	550	450
1	250	G.E.	MT-414	2200	300

Westinghouse Net Work unit with network protector, 500-KVA, 3 phase, 60 cycle transformer (13,200/11,790-120/208-Volts with throat connected primary disconnect switch both insertees filled with throat connected protector cubicle having following 3-pole air circuit breakers, all with (3) overloads —(1) 1600 amps. motor operated drawout breaker, (2) 600 amps. manual operated breakers, (3) 225 amps. manual breakers.

OUTDOOR OIL CIRCUIT BREAKERS
3-Pole—Electrically Operated

Qu.	Amps.	KV	Make	Type	Int. Cap.
1	400	72	Whse.	G-11	500-MVA
1	600	69	G.E.	FK-339	500-MVA
1	600	37	G.E.	FHKO-236	500-MVA
1	600	34.5	Al.Ch.	FVO-50-34X	250-MVA
1	400	37	G.E.	FHKO-136	250-MVA
1	400	15	G.E.	FHKO-136	300-MVA
1	600	14.4	G.E.	FLO-14 4-4	250-MVA

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1—D17,000 Caterpillar Power Plant.
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1—100 ton G.E. Diesel Electric Locomotive.
1—1500 CFM Chg. PNE. OCE Air Compressor.
3—1035 CFM Ingersoll-Rand XVH Air Compressors.

B. M. WEISS CO.
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6' x 14 ga. Pexto Power Shear.
600 Ton Southwark Inclined Wheel Press.
5' x 3/16" Beloit Initial Bending Roll.

FALK MACHINERY COMPANY
16 Ward St. Baker 5-5887 Rochester 5, N. Y.

1—AUTOMATIC COOLING BED FOR BARS up to 2" dia., consists of run-in table, cascade section, shuffle bar section, runout table, with all electrics, 200 ft. long.
1—28" x 46" HOT STRIP MILL, 2-high, reversing with 2500 HP D.C. motor, etc.
2—28" 3-HIGH ROLL STANDS with inlet, outlet and intermediate tables. Will produce 4" sq. billets from 8" sq. blooms in 6 passes. Includes bloom shear.
1—28" REVERSING BREAKDOWN MILL.
1—25" & 42" x 80" HOT STRIP MILL, 4-high.
1—28" PINION STAND, 2-high, modern design.
1—16 x 22" COLD MILL, 2-high.
1—12" x 12" COLD MILL, 50 HP motor.
1—10" x 10" 2-HIGH COLD MILL. Combination pinion stand and gear, extra forged steel rolls.
1—9" x 18" COLD MILL including uncoiler, recoiler and edging rolls.
1—10" ROD MILL.
1—9" BAR MILL, 3-high.
1—REEL, 11" face x 17½" dia.
1—UNCOILER, drag type, 60" maximum width, for cold mill.
1—RECOILER for 80" wide strip.
1—1500 TON STEAM HYDRAULIC FORGING PRESS.
1—34" x 192" ROLL GRINDER
2—90-ton Treadwell HOT METAL TRANSFER CARS.
2—65-ton ELECTRIC MELTING FURNACE, TOP CHARGE, with all electrical and mechanical equipment including 15,000 KVA and 13,333 KVA transformers.
1—ROLLER LEVELLER McKay, rolls 80" face & 5½" dia. with gear box and universal spindles.
1—STRETCHER LEVELEAR for sheets, 500,000 lb.
2—KANE & ROACH BAR AND ANGLE STRAIGHTENERS, Size #4, cap. 3" x 3" x ⅜" angles 3½" channels and 2" bars.
1—STRAIGHTENER, MEDART No. 0 for rounds 1¼ x 1½ dia.
1—STRAIGHTENER, MEDART No. 04A, for rounds ⅛" to 1" dia.
1—MORGAN FLYING SHEAR FOR BARS up to 1½" square, moving at speeds up to 1800 FPM.
2—UNITED HOT SAWS, 50", sliding frame.
1—UNITED #4 BAR SHEAR vertical open side.
1—156" x ¼" SHEET SQUARING SHEAR.
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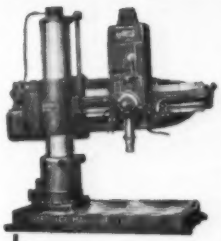

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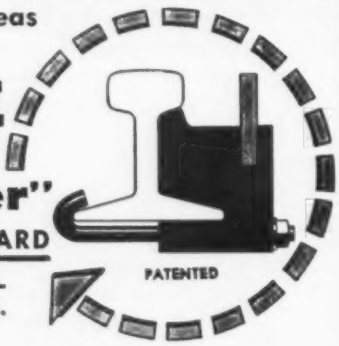

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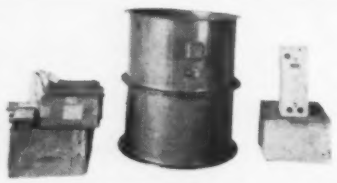

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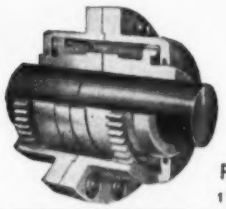

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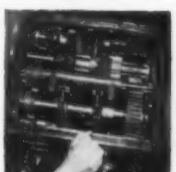

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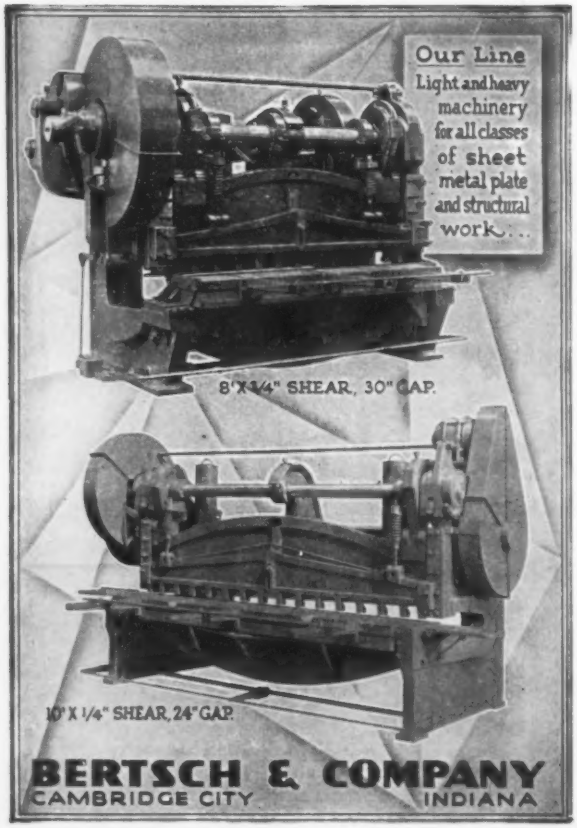
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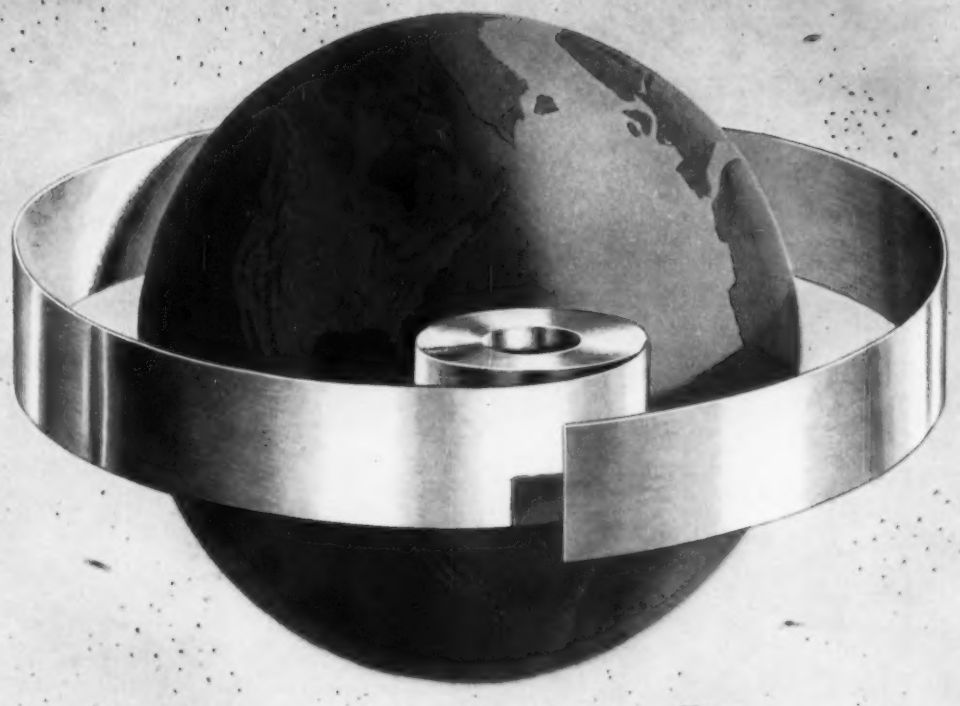

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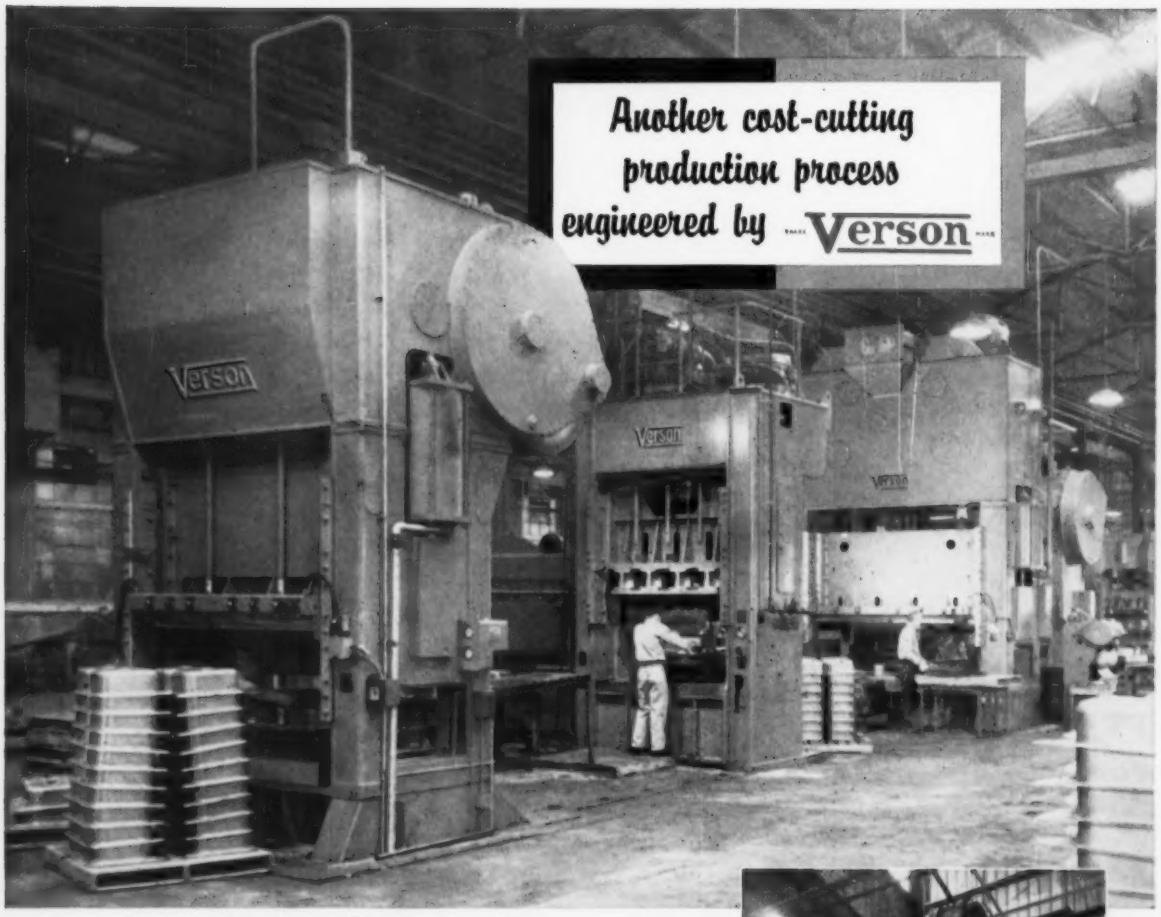
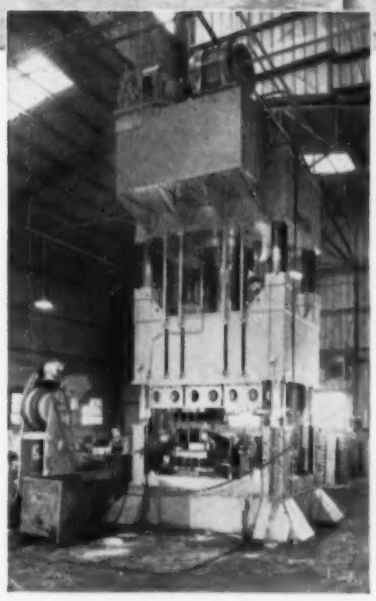


This Verson line-up cuts costs on double sump sinks



●The press line illustrated above, part of the final operations in forming double sump sink units before porcelain enamelling, includes Verson eccentric, hydraulic and crank presses. Previous operations on the sinks include deep drawing the sumps to a depth of 7⅜" from 14 gauge Armco deep drawing stock on a 1000 ton Verson hydraulic press and piercing and embossing the center drain hole in the sinks on a Verson O.B.I. Both of these presses are shown at the right.

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